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CORE i5 IS HERE!

Intel's new Core i5 processor is destined to replace the Core 2 Duo chips that power many of today's PCs. We crack it open in the Labs. **See page 42.**

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06 editorial

TONY SARNO

THE MAKINGS OF A REVOLUTION THAT APPEARS TO HAVE HIT FROM ALL ANGLES ALL OF A SUDDEN

Someone once characterised network administration as hours of boredom punctuated by moments of sheer terror when the company network suddenly goes down. The same has been said for database administration (and for test flying). Let me add another: keeping watch of PC technology developments. Intel's Core 2 Duo processors have been around for a while and have settled into a tranquil existence in the majority of new PCs sold today. Meanwhile, Windows XP has been running the show in a great many PCs since before Ansett Airlines went out of business. The stark reality is that despite *APC*'s best efforts to highlight the excitement of the PC industry, not much has happened at a really fundamental level to the PC package for several years.

But suddenly we now have some moments of sheer excitement, if not terror, as major development after major development hits the PC market. First is Windows 7. For all the guff about it being Vista with the bugs fixed, Windows 7 is of momentous importance because it's the true successor to XP — yet since its first public beta was first released in January, consumers and corporates have had only a few months to test it out before it arrives in the stores on October 22. At the same time, Intel has announced a new line of CPUs that promise to make Core 2 Duo irrelevant, being similarly affordable but in another league in terms of performance. The new Core i5 and Core i7 800 series CPUs come only months after we got our hands on the first Core i7s, and, as our cover story on page 42 shows, they are clearly going to become the processor of choice for mainstream CPUs. Then throw in the sudden arrival of solid state disks that are already coming down in price at smaller capacities and you have the makings of a revolution that appears to have hit from all angles all of a sudden. The mainstream PC you can build or buy in a few months will be an order of magnitude more powerful than one you can acquire with the same amount of money now. Bring it on!

tsarno@acpmagazines.com.au

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APC's Highly Recommended award is bestowed upon products that are of great overall quality.

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technotes

THE NEW, THE NEWS & THE QUIRKY VIEWS

Bytesize

Mini news

HEINZ USB MICROWAVE

It's a microwave! That runs off your USB port! We were a bit confused as to how a USB port can create enough power to generate microwaves of the kind found in a microwave oven. The reality is that the Beanzawave heats up food using very lower power microwave radiation, like that emitted by your mobile phone. The Beanzawave is being developed by the Heinz company as a possible promotional item for selling its baked beans. At 7in tall by 6in wide and 6in deep, the Beanzawave could heat a cup of food or a mug of drink easily. Makes you wonder how many phone calls it would take to cook a human brain? Hmmm. Never mind. The proof could literally be in the pudding with regards to the 'mobile phones don't give off dangerous radiation' debate! ***CZ***

World's cheapest netbooks

Chinese companies are making netbooks that cost $130 — but are they just oversized PDAs?

We thought Kogan's $399 Agora netbook was getting pretty cheap, but it's not in the same league as two virtually identical "netbooks" by Chinese makers Lanyu and Jointech, both of which sell for around $130 Australian. But calling them netbooks might be stretching the term, since the Lanyu's eBook LY-EB01 and Jointech's J-Pro JL7100 seem more like supersized PDAs, with 800 x 480 pixel LCD displays and ARM-based processors at their core. The Windows OS on their screens might look familiar, but it's not XP. With only 128MB of RAM in the eBook LY-EB01 and 64MB in the J-Pro JL7100 they can't even run Linux. They are powered by Microsoft's Windows CE, an OS developed specifically for embedded devices which can function in as little as 1MB of RAM. Overall the Lanyu seems better value, with more RAM and up to 8GB of flash storage vs 64MB of storage for the J-Pro JL7100. Both claim battery life of over 4 hours. While they might be supersized PDAs for now, we have no doubt they are the forerunners of a new wave of hyper cheap netbook-like computing devices.

HOT PRODUCT

Sony PlayStation 3

The newly released PS3 is slimmer, lighter and a whole lot cheaper!

Sony's PS3 has always been by far the most expensive console on the market, but that has all changed with the introduction of the new model PlayStation 3, dubbed the PS3 Slim.

Made available in Australia and New Zealand on September 3, it is still early days as far as sales go, but with an RRP of $499.95 in Australia (compared to $699 for the PS3) and $629.95 in New Zealand, it is highly likely that this price drop will entice more gamers onto Sony's high-definition system.

The new PlayStation 3 has been redesigned from the inside-out with a new-look body and a new logo. The internal design architecture of the new system, from the mainboard and power supply unit to the cooling mechanism, has been completely redesigned to achieve a much slimmer and lighter body. Compared to the very first PS3 model with 60GB HDD, the internal volume as well as its thickness and weight are trimmed down to approximately two thirds. The new PS3 is also greener, as it uses up to two thirds less power.

Realising that the PlayStation systems are being used for more than just gaming, Sony has discarded the smaller HDDs in favour of a 120GB drive that will go a bit further in making users' digital content more readily accessible. With Blu-ray capability and HD gaming in one package, the new PS3 has become a more tempting (and affordable) entertainment option.

Christopher Zammit

TOP 10 ...TECHNOLOGY RECALLS

Computer products are recalled regularly. Here is a list from the Australian Competition & Consumer Commission recalls site (*recalls.gov.au*), with the hazard they constituted.

1 CHOKING
Easy PC keyboard for toddlers shattered when dropped, producing small parts.

2 WRONG DEPTH
Some Garmin BlueChart g2 Card and BlueChart g2 marine charts showed water deeper than it was.

3 CHOKING
HP promotional USB key shaped like "Kung Fu Panda" had a small cap that could be swallowed by children.

4 FIRE
The i-mate JAMA 101 mobile phone batteries could generate excessive heat and lead to fire.

5 OVERHEATING
Lithium-ion batteries in a GN Netcom Australia 9120 wireless headset could overheat.

6 ELECTRIC SHOCK
Crack in Eaton Power Powerware 3105 and 5110 UPS Systems could lead to loss of earthing.

7 OVERHEATING
Chip in Netgear XE103 85Mbit/s Powerline Ethernet Adaptor had potential for overheating.

8 ELECTRIC SHOCK
King Power Surge Protector Power Boards had issues that could lead to electric shock.

9 SHORT CIRCUIT
Line filter assemblies in PSUs of HP Integrity rx4640 and HP 9000 rp4440 servers could dislodge.

10 WRONG DEPTH
Software programming error in Scubapro Uwatec and Smart Pro and Smart Com dive computers could give inaccurate diving information.

WHAT'S IN WINDOWS 8?

Microsoft is already looking to the next generation of its OS.

Microsoft isn't saying anything about a service pack for Windows 7 — and work has already started on Windows 8. There were planning meetings covering requirements going on in March and the team started gearing up towards the end of July.

Don't expect a lot of details just yet: for two of the three years that it was working on Windows 7, Microsoft kept very quiet. However, one feature we know will get some attention is multi-monitor support. "We're all multi-monitor users at Microsoft," points out Senior Vice-President of Windows, Steven Sinofsky. There wasn't time to deal with all the ramifications of this concept for Windows 7 without delaying the operating system. As Sinofsky points out, "What if you have three monitors side by side and you only want the taskbar on two of them? What if you have screens stacked vertically?" Hopefully Windows 8 will see these questions answered.

There will be more work done on untangling MinWin (the lowest level of system services), separating the Windows APIs from the binary implementation in any given version of Windows, and on taking advantage of the new user mode thread scheduling for many-core systems. Also, expect Microsoft to make the Windows kernel run on ARM, Snapdragon and other low-power processors: Windows 8 will also be the future of Windows Mobile.

WINDOWS 7 IS LOCKED DOWN

The RTM version of Windows 7 is out with no surprises.

Unlike Vista, Windows 7 isn't going to be delayed, dragged down by compatibility issues or crammed full of half-finished features thrown in at the last minute. What you saw in the Release Candidate is what's in the now-closed-off Release To Manufacturing (RTM) version minus the debug code, and with the final round of bug fixes. The RTM is already with OEMS and will reach general customers on 22 October.

Rich Reynolds, the General Manager of Windows Business, says "When we released the RC, it was very much our intent that that was our final code releasing. Frankly, we didn't anticipate any major changes and that has proven to be true. There are no major changes, aside from some minor bug fixes from customer feedback."

Microsoft isn't giving any specific details of what those bug fixes are, but they were tested by the OEMs and the companies on the Technical Adoption Program, which all received build 7201 as a second release candidate. Counting partner testing, internal QA, automated testing and regression testing, Reynolds estimates that Windows 7 went through 1.6 million hours of testing torture.

There's plenty of work left for the Windows launch. PC manufacturers are busy finalising the new systems they'll launch in October and choosing what software to preinstall. On PCs with Windows 7 Professional edition, their choices may include XP Mode, which isn't part of the current RTM code. "Many PC manufacturers are looking to preinstall XP Mode as part of that [edition] so it will include both Windows 7 Pro as well as XP Mode preconfigured for you," explains John Curran, Director of the Windows Client group. "For folks upgrading to Windows 7 Pro, it will be a separate download." And for Microsoft, there are content deals to negotiate for Windows Media Center's internet TV feature in each country.

TRIBAL COUNCIL...

APCMAG.COM ASKED
Are you worried about data privacy in cloud apps?

YOU REPLIED
32% 24% 44%

APCMAG.COM ASKED
Would you buy Apple's rumoured tablet?

YOU REPLIED
29% 22% 49%

HEAD2HEAD

The iPhone has swept everything before it in the consumer smartphone market, but is it making inroads against the BlackBerry?

	BLACKBERRY BOLD	IPHONE 3GS
Applications	Frankly, the Berry is not even in the ballpark. Australians still don't have access to RIM's App World, which carries around 2,500 applications. Most apps still net downloads.	Apple's App Store is available and has about 65,000 apps. Every day there are new ones. We are starting to hear about treatment clinics for iPhone app addicts.
Ability to run apps	BlackBerry memory and memory management not suited for running lots of apps — forums full of users running out of memory after installing just a few programs.	Designed from scratch to run apps, so some users cram hundreds on one device. Also, easier to develop for than BlackBerry because RIM keeps tight control over its APIs.
Web browsing	The Berry's native browser does a reasonable job, while the Opera Mobile browser is better. But neither is a match for the iPhone's Safari browser.	The Safari browser is far and away the better browser, aided by better screen real estate and navigation. Despite the size, it's actually a delight to surf the net with it.
Email	When run through a corporate BlackBerry Enterprise Server the Berry provides real-time wireless synchronisation of emails, tasks, contacts, and calendar, making it truly an extension of Microsoft Outlook. Not as real-time through BlackBerry Internet Service (personal service through ISPs).but still superb email management.	Email on the iPhone is prettier but has barebones features. Ironically, it's easier to link directly to an Exchange Server with an iPhone, but the only way to get push email is to pay for an Apple me.com account. For corporates the iPhone doesn't come with the kind of high-grade network security behind the BlackBerry.
Keyboard	Most BlackBerrys have a Qwerty keyboard and trackball. Once you learn two-thumb typing, you can bash out long emails and even documents surprisingly quickly. Critically, you can type without looking at the keyboard every key press.	Once used to it, the iPhone's onscreen keyboard (and auto correction) are pretty good, arguably the best virtual keyboard ever. But again, not so good for professionals who may need to work on some long emails or documents where a virtual keyboard won't cut it.
Battery life	Turn off Wi-Fi and the BlackBerry battery lasts for a couple of days, like a true smartphone. This is the device you want when travelling and cannot afford to lose phone and email contact with the office.	The big elephant in the room. iPhone aficionados say you're lucky if an iPhone charge lasts a day, but they silently accept it as the price for the multimedia candy. iPhone users manage by leaving lots of chargers everywhere.
Verdict	Despite the iPhone's thundering presence, a BlackBerry is still easily the superior option for professionals who need to be connected to the office. It's able to survive quite rough treatment. But needs way more apps and has to manage them better to compete in the consumer stakes.	The consumer superstar. A tiny portable computer with thousands of great apps and a gorgeous UI that make it irresistible to consumers and geeks. But as a phone it has one showstopper flaw: poor battery life. Think twice if you'll use it primarily as a phone. It's also quite fragile, so don't drop it.

NUMBER CRUNCHING

2,576,980,377,524
THE NUMBER OF PI PLACES CALCULATED BY A SUPERCOMPUTER AT UNIVERSITY OF TSUKUBA, JAPAN, USING 640 QUAD-CORE AMD OPTERONS

400,000,000
PREDICTED SALES OF SMARTPHONES IN 2011

1,100,000
PCs, NOTEBOOKS AND NETBOOKS SHIPPED IN AUSTRALIA IN FIRST 3 MONTHS THIS YEAR (IDC)

THE (A)PC REVOLUTION
OCT / 1993

ADS TO HIT THE INTERNET

Internet users, previously able to avoid the clutter of ads on the worldwide network will soon be facing two different batches of electronic ads, starting this month.

Internet users will also begin to see advertising on fax cover sheets and email messages (part of a new service using the network to send free faxes around the world).

MICROSOFT TO RELEASE WINDOWS UPGRADE

In a move that defies its apparent marketing genius, Microsoft is releasing a major upgrade to Windows 3.1 and Windows for Workgroups 3.1 and promoting it as a minor release.

The new version of Windows, called Windows 3.11, introduces some key modules from Microsoft's Windows 4 (Chicago project), drastically improving performance and significantly expanding the number of value-added utilities bundled with the products.

HOT PRODUCT

The coolest new cat

We rack up the most important features in Apple's new Mac OS X 10.6 Snow Leopard.

1 SPEED TO SPARE

The performance results of Snow Leopard's extensive architectural overhaul are immediately apparent. Apps open noticeably faster, especially ones like Mail, which have to load large databases, and the system is much more responsive when switching between programs. Using Apple's iDVD app to create a DVD image involving several video clips, menus and effects took 28 minutes in Snow Leopard compared to 46 minutes in OS X 10.5 Leopard.

2 32-BIT AND 64-BIT IN ONE BOX

Unlike Windows, OS X can simultaneously run in 32-bit and 64-bit modes. The kernel still launches in 32-bit mode so as to support 32-bit apps and drivers, but 64-bit programs run in their native full throttle mode. Apps which have a mixed heritage, such as a 64-bit version of Photoshop running 32-bit plug-ins, will be automatically started or relaunched in 32-bit mode.

3 EXCHANGE 2007 SUPPORT

MacBook owners who work in a Microsoft-based office will welcome the ability to use Mail, iCal and the Address Book as full Exchange 2007 clients. These lightweight apps are a superior solution to the Microsoft's bloated and bulky Entourage.

4 QUICKTIME X

The slick and streamlined new multimedia player boasts features previously restricted to Apple's $45 QuickTime Pro upgrade. The player can record on-screen video and audio through the mic, for making quick video tutorials, along with webcam video. Pared-down export options simplify the saving process for iPhone, iPod and Apple TV as well as direct uploading to YouTube and iTunes.

5 MULTITHREADING AND MULTICORE MADE EASY

A new OS component named Grand Central Dispatch taps into the multicore processors now found in all Macs. Baking GCD into the OS itself Apple not only enhances Snow Leopard's native performance, it also opens up the means for third-party software to more easily use multithreading and multicore operations. Instead of calling out each threaded task in a program, developers need only to break the data into self-contained 'threadable' blocks that are then handed over to GCD for allocation to each thread.

6 THE NO-BRAINER PRICE

$39 for a major OS upgrade? And $69 for a five-user 'family pack'? Apple is smart enough to know that in lieu of show-stopping features, an appealingly low price tag will win over the punters. Take note, Microsoft!

David Flynn

Mustknow

Essential Knowledge

HOW GOOGLE STORES DATA

For a company that indexes the web and stores the emails for millions of people, Google doesn't like to say how it serves those hundreds of petabytes of data. However it revealed a few juicy details at a recent conference in California. Google's chief server designer, Ben Jai, told the audience that Google builds its own rack-mounted servers and runs them packed in their thousands in standard shipping containers. The servers run on x86 processors and each has its own 12 volt power supply. The radical move to integrate batteries means Google doesn't have to rely on massive UPS units, reducing the chances of a mass failure if power goes down and the UPS is not available, whilst also keeping UPS costs strictly in line with the number of servers.

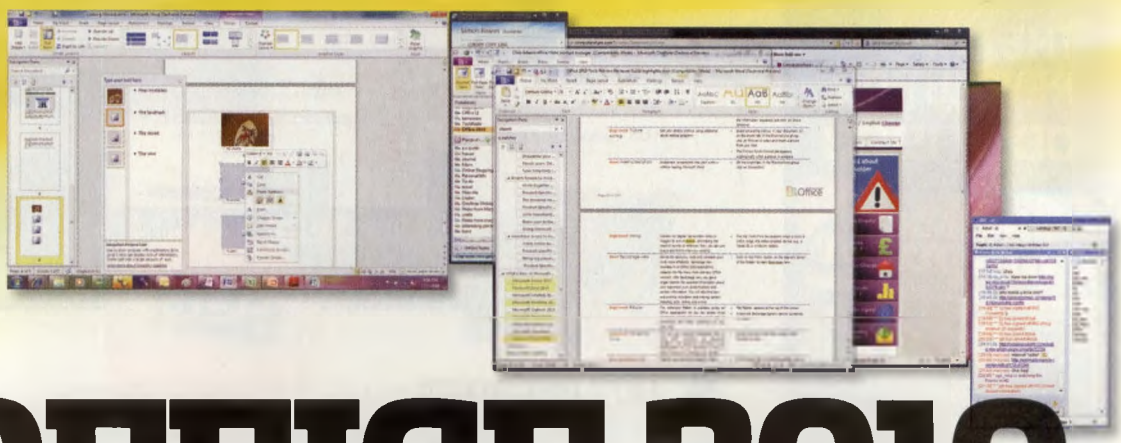
Topsite

URL of the month

WORLD WIDE METRIC

How often do you find yourself searching for a calculator to convert imperial to metric and vice versa across multiple measures? We recently discovered the World Wide Metric Conversion calculator, and it's now a must on our bookmarks. It neatly converts across length, weight, pressure, volume and temperature, using one single, easy-to-use interface.

worldwidemetric.com/measurements.html



OFFICE 2010 UNVEILED

The latest MS Office suite boasts handy new features, but the big improvements are yet to come, says **Mary Branscombe**.

The Technical Preview edition of Microsoft Office 2010 has arrived, and it looks a lot like, well, Office 2007. But that's not too surprising: the current release is a mix of fully functional client apps with a handful of new features, promised collaboration options that won't work until later and a vision of web apps that we'll see first as Live services sometime this year.

The ribbon interface introduced in Office 2007 had a mixed reception, but Microsoft's figures say that it does reveal once-hidden features, making it a success. Chris Bryant, the Group Product Manager for Office, explains: "The ribbon helped people use more of the Office applications in Office 2007 than they ever have before." He compares it to the introduction of drag-and-drop to Word in 1991. "Now it's a totally fundamental part of the productivity experience, a very essential thing. We think the ribbon will be very much the same in 10 years' time."

Office 2010 will help with that. Not only does the ribbon make an appearance in all the applications (Outlook, OneNote, Visio, Publisher and even SharePoint), but now you can customise it, removing features you never use or creating your own tab with the commands you want. This is much more useful than adding icons to the Quick Access Toolbar because the buttons are bigger and easier to read. You can also organise them into labelled groups and export the customisations for import into another copy of Office.

There are also subtle changes to the colour and style of the ribbon itself. The Office button has shrunk to the position of a ribbon tab heading, matching the ribbon interface for Paint and WordPad in Windows 7. This looks neat but loses the advantage of being easy to reach with the mouse. The Office menu has been renamed the Backstage menu because it's home to options that you don't use all the time. The options given vary between apps: they all have Live Print Preview and Document Properties, but PowerPoint has options for packing up presentations, for example, and Access has functions for analysing or repairing your database.

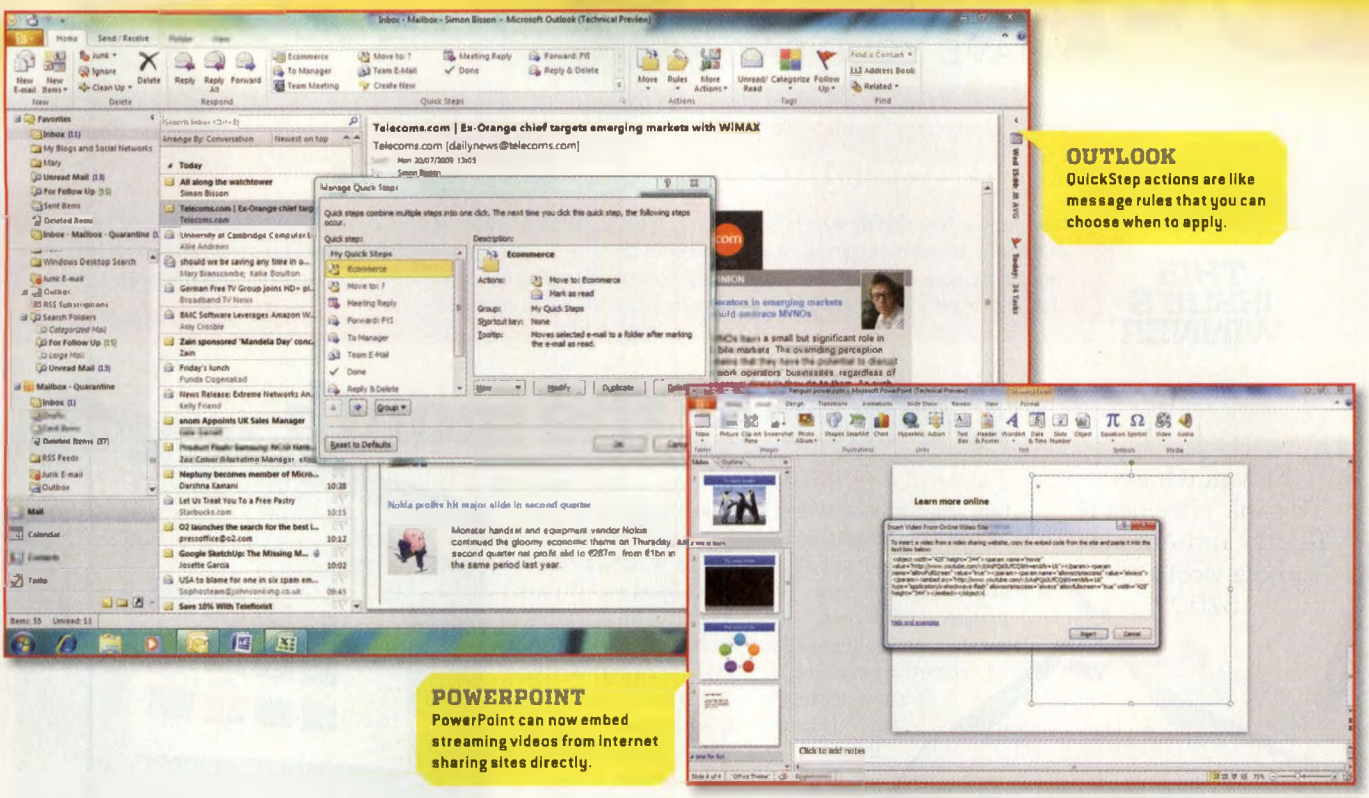
MORE LIKE INTEGRATION

Many new and improved features are also shared across apps. The Paste Options smart tag is more prominent, with context-sensitive icons to help you pick formats to paste in. The Live Preview is more help than all those cryptic icons, too.

The image-editing tools in Word, PowerPoint and even Excel give you artistic filters and multiple presets for changing the contrast and brightness or colourising images. They all have live previews too, though Publisher still lags behind with more primitive editing tools, which is odd for a DTP package. The background-removal tool uses new techniques from Microsoft Research to find the background in an image and make it transparent. You can fine-tune it by marking areas to keep or remove; the only drawback is that you have to change the scale of the resulting image by hand.

SmartArt in Office 2007 was a nice idea that was only really useful for business diagrams. The latest version includes more layouts, many for arranging photos as well as text. You can also get to the layouts via the new Picture Layout option. Instead of lining up images by hand or trying to force them into a picture, you get stylish layouts that automatically resize images and format text.

The new video-editing tools in PowerPoint are like the photo-editing tools: they're basic options to save you opening a separate program for simple changes. Being able to trim a video clip is such a useful feature you'll be surprised you didn't have it in previous versions, and tweaking brightness and contrast is handy. You can also embed clips from streaming video sites. We had problems with some YouTube videos, but others embedded and played flawlessly.



OUTLOOK
QuickStep actions are like message rules that you can choose when to apply.

POWERPOINT
PowerPoint can now embed streaming videos from internet sharing sites directly.

The new slide transitions and animations are slick and stylish. If you create a custom animation you can apply it to multiple objects with the animation painter. Video, transitions, animations and all the other PowerPoint features also work in the new Live Broadcast tool. This uploads your work, allowing you to distribute the URL and hence control your presentation through the web browsers of your audience.

Word, meanwhile, gets its own navigation bar, which gives you a high-level outline view based on headings. It lets you drag sections around, create new headings in the bar or browse thumbnails of pages. If you search inside your document headings, matching content is highlighted. You can also see the matches as excerpts or thumbnails.

Until the collaboration tools work properly, Word only has two other new features. You can use the full set of OpenType font features, from ligatures and small caps to alternative styles. The dialog box has no preview, though, which means that you can't tell if your font supports alternatives. Also, the garish WordArt effects now use the same glow, reflection, shadow and 3D options as SmartArt. Oddly, there are two ways of applying these, one that lets you customise settings and one that doesn't.

CHANGING FOCUS

Access 2010 is still part of the Office suite, even though it seems a bit forgotten. There's not a lot new in Access beyond user interface tweaks. One change, however, is the arrival of a Web Design view for quick intranet and web application development, which automatically creates a web-ready database. New web form components give a Web 2.0 feel.

Microsoft has been steadily turning Excel into a data-analysis tool, using it as a front end to hefty data sources in SQL Server. You can still use it as a straightforward spreadsheet if you wish, but most of the new features are designed to help visualise data. Design guru Edward Tufte's Sparklines (little inline graphs in a table) appear in Excel at last and add a quick trend view to tables full of numbers. Pivot tables get a reworking, with a new set of Slicers to simplify exploring large quantities of data.

Excel's core calculation engine also gets a work-over, with more accurate statistics functions, and noticeably improved financial functions as well.

OneNote has been the hidden gem in Office for a long time now, but thankfully Office 2010 finally makes it a first-class citizen. This handy app is now included in all of the different versions and is a very welcome inclusion. Microsoft talks about it as a tool you always have open (like Outlook), and it gets a powerful new search bar.

Outlook 2010 gains much more than the obvious new UI. One of the biggest changes is support for more than one Exchange account, while MailTips pulls information from Exchange and other Microsoft servers in order to warn you if you're sending mail to someone who's out of the office (these only work with Exchange 2010). Outlook 2010's Quick Steps are an easy way of automating common actions by making them a button in the ribbon. Finally, one important change is the reworking of Outlook's conversation view, which makes it easier to read and manage mail threads.

WAIT AND SEE?

Individually, these are all small features. For most of the apps, they're still small changes even when you add them together. Without the promised collaboration features, Office 2010 is an incremental, upgrade. The revolutionary new features depend on both SharePoint 2010 and the upcoming Office web apps, and until they work it's hard to give a definitive verdict on the Technical Preview. The signs are promising, but we won't know more until later in the year.

14 epinions
HAVE YOUR SAY

epinions@acpmagazines.com.au

Come on, have your say! We want to hear what you think. Add to these discussions or email your views (in fewer than 250 words) to epinions@acpmagazines.com.au. All correspondence becomes the property of *APC* and is subject to editing. Letters must include writer's full name, street address, suburb, state and phone number to be considered for print publication and to be in the running for Letter of the Month prizes. Address and phone details will not be published.

THIS ISSUE'S WINNER

Steven wins a TP-Link Wireless N Router and Adapter bundle worth over $200.

Letter of the month

BALANCED OPINION

I am a high-school student and tech enthusiast, and Vista Basic is not as bad as some readers seem to think. It hardly ever crashes, and only when I do something extreme, like overclocking my CPU higher than it supports. XP is very reliable, I admit, but I like an OS to look good while doing everything I expect. In this, Vista excels. Windows 7 is a great OS as well: I'll run it in a virtual machine until I get the courage up to install it as my main OS. I think that Microsoft's OSs have been steadily getting better over the years and am looking forward to Windows 7.

Steven Smith
Armadale, WA

School's out for summer? Not this month, it would seem, as our readers vent their spleens on a multitude of education-related topics.

FOUR REASONS

The NSW Education Department's decision to hand out a Lenovo netbook to every student in year 9 to 12 is well-meaning but misguided. First, netbooks are not notebooks. They are severely crippled machines good for little more than email, web surfing and light office duties, not exactly making for a great computer experience. Two, the netbooks will break in their thousands in the rough and tumble of the school playground. Three, many will be lost or stolen. Four, within a year they will be obsolete. Do we get the kids another round of machines then? Why not spend the money providing kids with better computer facilities in the schools, higher-grade network access from home PCs and training more teachers who will inevitably be called on to help manage this misguided largesse from the gov't?

Peter Young
Sydney, NSW

BAD BACKS

I am all for encouraging the use of technology in the classroom and can understand the appeal of cheaper alternatives, but has anyone considered the long-term effects on the spine of prolonged use of a cramped keyboard and miniature screen?

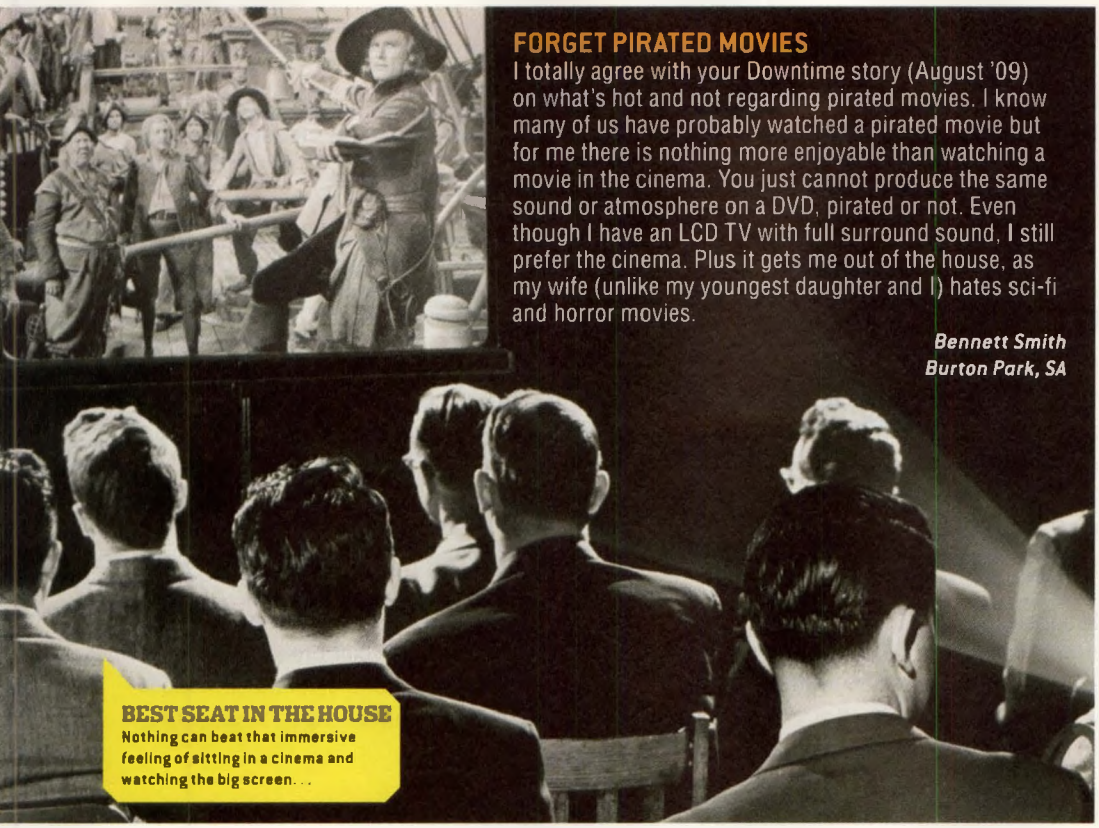
The purpose of a netbook is to provide a simple way to take notes or send the odd email when it is impractical to use an ergonomically sound workstation or when the weight of a notebook is too cumbersome. It is not designed to be anyone's primary machine. If you give a netbook to a teenager, it will be used in most classes, almost all homework and any other computer-related activity. Why would they use the shared family PC or school workstation when they have their own dedicated machine?

As a long-term sufferer from back pain primarily caused by extended use of a notebook, I am all too familiar with the aches and pains these children have in store for them. I fear the only long-term winners will be the physiotherapists and osteopaths of tomorrow.

Jeremy Pyman
Bentleigh East, Vic

LOCKED DOWN

It is true that NSW high school students are receiving free Lenovo S10es, but contrary to what Brad Bennett said in September's Epinions, students aren't allowed to modify the netbooks in any hardware or software-based way. Instead, the netbooks will be locked down and made slaves to the DET, giving us only limited access to the administrator options. Before receiving the netbooks, students are required to sign a contract, giving up our rights to netbook modification, such as dual-booting Linux or installing say, a Wacom graphics tablet driver.



BEST SEAT IN THE HOUSE
Nothing can beat that immersive feeling of sitting in a cinema and watching the big screen...

FORGET PIRATED MOVIES

I totally agree with your Downtime story (August '09) on what's hot and not regarding pirated movies. I know many of us have probably watched a pirated movie but for me there is nothing more enjoyable than watching a movie in the cinema. You just cannot produce the same sound or atmosphere on a DVD, pirated or not. Even though I have an LCD TV with full surround sound, I still prefer the cinema. Plus it gets me out of the house, as my wife (unlike my youngest daughter and I) hates sci-fi and horror movies.

Bennett Smith
Burton Park, SA

As for the highly restrictive filter of the current school computers, it is simply designed to increase productivity.

Henry Chim,
Gordon, NSW

iPHONE PROBLEMS

I am a doctor on call to a major hospital and was shocked when the iPhone I bought two months ago suddenly stopped working properly. After I remove the earphones, the ring tone continues to go to the earphone socket. This suggests to me that it is a faulty hardware or software problem, even though the Apple web site suggests fine debris in the socket plug as a possible cause. Maybe I have too many degrees but I cannot comprehend how lint could short-circuit a plug. As others have commented, the fault is intermittent but extremely frustrating. I have to ask myself whether I am potentially risking a patient's life every time I carry my iPhone or do I go back to using my not-so-hip old brick of a Nokia?

Dr Adrian Elderhurst
Bendigo, Vic

LINUX CONSPIRACY

In response to the Linux Conspiracy letter in the August issue about who uses what OS, I have been using PCs since the days of DOS, and before that I used C/PM on large institutional mainframes. The letter writer has it wrong. His numbers — in which he splits the computer-using population into 89% Windows, 6% Macs and 4% Linux — are spurious to say the least. He forgets that most of the internet and most large businesses use Linux/Unix systems at their cores.

All operating systems have flaws and quirks, NONE are perfect, and taking a side in this argument is a waste of your time and the magazine's space.

For those arguing about the merits of operating systems, find an OS you like and shut up!

Andrew Stanstiuck
Yamba, NSW

SOUND NAMES

I was taken aback by the first statement in a review in the September issue which said: "The only name in high-quality sound cards used to be Creative Sound Blaster." You have got to be kidding. In my experience, Sound Blaster are to high quality as low bit-rate MP3 is to CD quality. Over the years there have been several sound cards that outperformed Sound Blaster like M-audio, Yamaha and the like. If I wanted a sound card for superior audio reproduction, I would certainly look at the ASUS. If I still wanted to do audio production on a PC, I would go with a Terratec USB-connected box.

Peter Farrelly
Narrabundah, ACT

apc

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16 enduser

FROM THE READERS OF APC

apcenduser@acpmagazines.com.au

Do you work in the IT industry and are forced to deal with inept and clueless end users on a daily basis? If you have an interesting or amusing story, email us at apcenduser@acpmagazines.com.au. All correspondence becomes the property of *APC* and is subject to editing. Letters must include writer's full name, street address, suburb, state and phone number to be considered for print publication and to be in the running for prizes. Address and phone details will not be published.

Arthritis the cause of failure

Reader John Curtis has been a software developer for nearly 20 years and as a result does a lot of family tech support. He recently bought a new Dell notebook for his mother who is in her 70s. "After initial setup and basic instructions she was away, happily surfing and emailing," he says. "Then after about a month I started getting calls from her saying the computer would turn itself off after just a few minutes when writing an email or letter."

Curtis says his mother rang Dell support in India a few times but a combination of accents, deafness and a lack of understanding of technical jargon defeated that line of enquiry. So he took over. "I removed some of the Dell junk, changed the power settings and verified the hard disk was OK, but she still had the same problem. But for me, the notebook ran perfectly. So I sat down with her and watched what she did. I was amazed to see the notebook turn off after she had been typing for a couple of minutes. Again I couldn't replicate the problem."

This went on for an hour or so by which time Curtis was out of ideas. "Then just as I was about to give up I noticed a bracelet she was wearing, while not touching the notebook, was hovering quite close. Could there be some interaction? Then she mentioned the bracelet was a 'cure' for arthritis and was magnetic! I got her to take it off and, voila, problem solved.

"I assume the magnets waved over the notebook induced a small current that triggered a phantom input. So beware of mixing science and magic!"

CRAZY SYSADMINS

Hong Liang, from Melbourne, says he realises that IT sysadmins can get obsessed with maintaining the security of the network, but one that he worked with went too far. Asked by his non-technical manager to share various network and server administration passwords, the well-meaning sysadmin refused, arguing he would no longer guarantee the security of the business. The conversation, says Liang, went something like this:

Sysadmin: "I can't give these to you. Now they are secure; with you they may not be."

Manager: "I shouldn't have to plead. Can you please give me the passwords?"

Sysadmin: "You should not be poking around in our servers."

Manager: "They are not our servers, they are my servers, I run this company!"

Sysdamin: "You may well do, but you know nothing about IT and you should let experts worry about that."

Manager: "Well, you can go and protect Centrelink's computers if you don't listen."

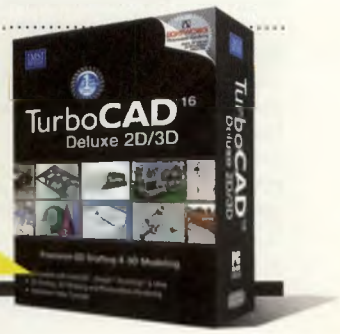
A disbelieving Liang listened as the argument went for another five minutes, until the sysadmin caved in, shaking his head and cursing under his breath. "He was lucky to keep his job, but he became a bit of a hero to other staff!" says Liang.

This reminds End User of the celebrated example of Terry Childs, the network administrator for the city of San Francisco, who was so protective of the network he architected and maintained (much of the city's council's information flowed through it) that he refused to give any of his IT colleagues administrative access to it. Childs kept refusing even when his employer called the police and he was arrested. He gave up the passwords only when the mayor of San Francisco visited him in jail and pleaded with him to give them up.

End User would love to hear about any similar stories of well-meaning (and dumb) IT staff. Published stories will receive a software prize.

WINNERS GET THIS

TurboCAD 16 Deluxe 2D/3D gives you unlimited design options with hundreds of professional drafting and design tools, incredible file support, video and interactive tutorials, photorealistic rendering and millions of symbols. TurboCAD Deluxe delivers everything you need. Create presentation-ready home plans, technical drawings, mechanical designs, artistic illustrations, crafts, school projects and more. Valued at $199.95. From Mindscape.com.au.



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Memory stick woes

Reader J. Blake tried to recover lost data from a USB stick using software bought online. However, when it didn't recover the files, he was left high and dry.

I recently had a disaster with my 16GB NTFS-formatted USB memory stick. It crashed, losing a substantial amount of data. I started to scour the internet for solutions. Googling brought me to **www.datadoctor.org**.

While it offered one solution specific to pen drives, I opted for the USB mass storage recovery option. This recovered most of the files, but — you've guessed it — not the ones that I was most keen to get back. DataDoctor then sent me the pen drive version of its software too, thinking that I'd ordered the wrong product. This piece of software managed to recover nothing at all, with a message claiming that the drive was probably beyond repair.

On visiting the main DataDoctor web site, it states in its terms and conditions that no refunds are payable as the company cannot tell if its products are going to be of any use. I'm not likely to use this piece of junk again, having spent nearly $60 on software that doesn't perform its stated function.

I then looked for Linux solutions and found GetDataBack for NTFS — this showed me all the missing files even in demo mode!

J. Blake

This is a salutary lesson in online software purchasing, I'm afraid. Proper contact details for this vendor, such as an address or phone number, are conspicuous by their absence from the DataDoctor web site — all you get is an email address, which doesn't instil much confidence. We recommend only buying from sites that display a physical postal address and a telephone number in the future.

The company running the web site would appear to be Pro Data Doctor Pvt Ltd, a jack-of-all-trades software developer based in Ghaziabad, India. As far as Australians citizens are concerned, consumer protection extends no further than the Australian border. As a result, when you buy goods outside Australia your chances of satisfactorily settling a consumer dispute are next to zero, even though local consumer authorities will still try to contact the relevant parties to try and sort the problem. Statements such as 'No refunds given' are simply not legal in Australia or similar Western countries.

However, demo versions of the data recovery tools this vendor sells are available for download. The vendor actually recommends trying out a demo to make sure it works before buying it. So Mr Blake really should have tried the software before he clicked the 'Buy' button. A little further Googling would have revealed a whole range of free file recovery tools, like Recuva, which would certainly have been worth a spin — as he now knows.

Finally, I can't help thinking that if a 'substantial quantity of data' was important, galling though it may have been, it would have been worth spending the extra money on well-known software to recover it.

Remember — you can always buy a new memory stick, but you can't buy a new memory stick with your data on. Unfortunately, Mr Blake is going to have to chalk this one up to experience.

FIRST AID?
If data loss problems beset you, be sure to check your options out carefully.

CONSUMER ADVICE

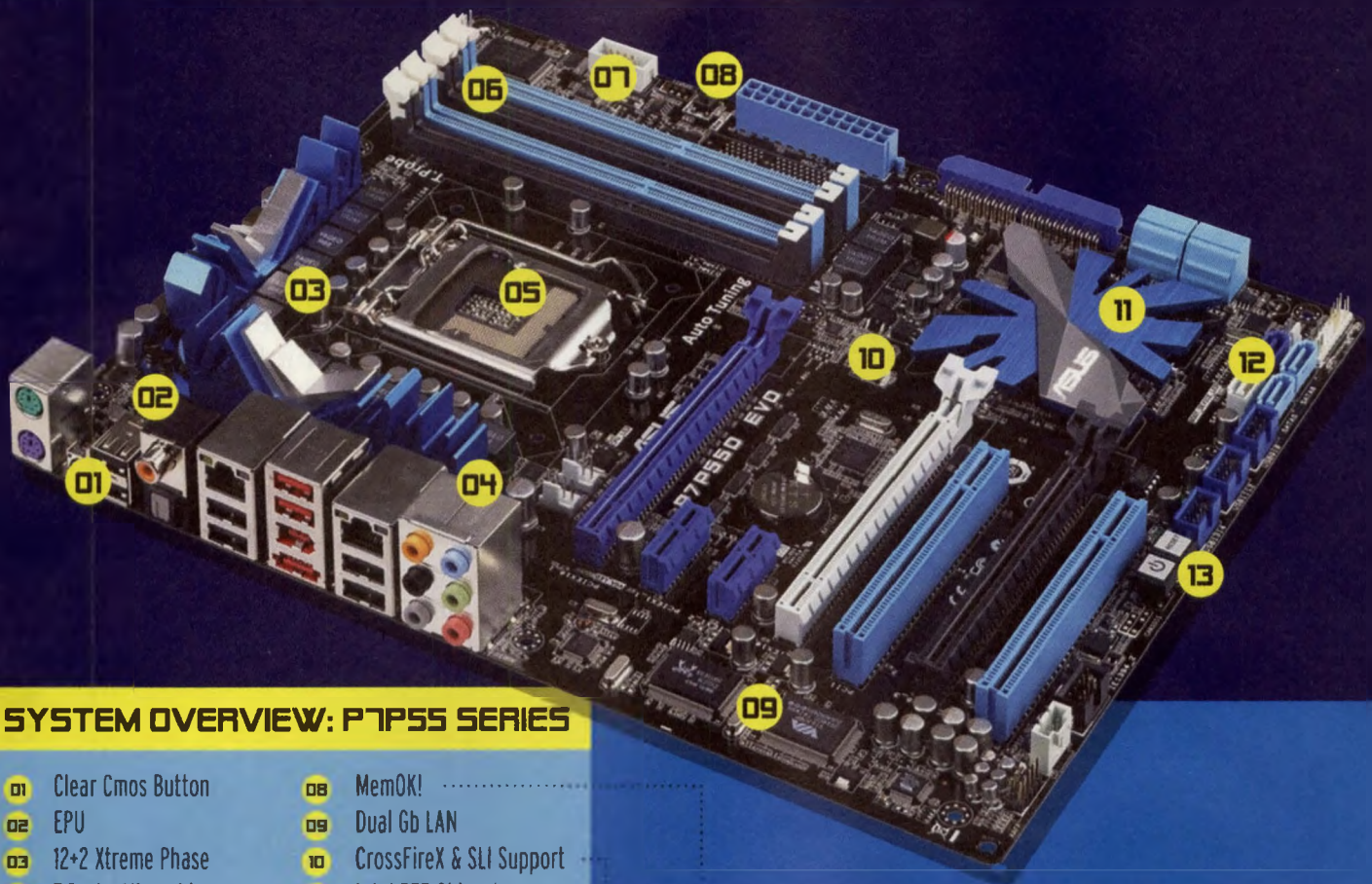
On a more general point, software currently occupies a slightly unusual place in consumer protection legislation, which is primarily concerned with the performance of 'goods' — things that are 'tangible' to use legal jargon. Software may have a physical existence (the disc that the software is supplied on, for instance), but once installed it is not a 'good' per se. Recent case law in Australia suggests it's regarded as a service. This glaring gap in coverage isn't too surprising — after all, most consumer legislation pre-dates the existence of personal computers.

So, where do we stand? While software may not constitute goods per se, courts are quite capable of applying any terms in the purchase contract that imply the program will be reasonably fit for a given purpose. Being blunt, the software should be capable of achieving what it sets out to do.

The other complication is the old chestnut that software is not sold but licensed. When you pay for a copy of Office 2007, all you're really buying is Microsoft's permission to use its software and nothing more. As a result, the argument goes, software like this isn't covered by the Sale of Goods Act.

Some clarity may be on the way. In the US, a Washington District Court last year held that a transfer of computer software represented a sale, not a licence. In Europe, the EU Consumer Affairs Commissioner recently called for software makers to be made to take on more accountability for the products they offer to consumers. APC

ANATOMY OF: ASUS P7P55 SERIES



SYSTEM OVERVIEW: P7P55 SERIES

01 Clear Cmos Button
02 EPU
03 12+2 Xtreme Phase
04 T.Probe Microchip
05 Intel LGA 1156 Socket
06 DDR3 2133 (O.C.) Memory
07 Turbov EVO O.C. Processor
08 MemOK!
09 Dual Gb LAN
10 CrossFireX & SLI Support
11 Intel P55 Chipset
12 Drive Xpert
13 Onboard Switch

HYBRID PHASE

XTREME PHASE

T.PROBE ACTIVE COOLING MICRO-CHIP

T.PROBE

New generation active cooling technology monitors temperature and status of each pwm voltage phase, auto adjusting and balancing the temperature of every pwm choke, extending the life of components and your CPU.

XTREME PHASE

Power on demand, good design automatically optimises power all the time.

MEMOK!

- Superior memory compatibility - Any memory is OK!
- Relieve your memory compatibility issues with one button rescue tool, auto loading preset settings

SLI AND CROSSFIREX

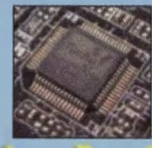
The P7P55 board has multi GPU support, giving the option of either AMD Crossfire or NVIDIA SLI graphics solutions.

DRIVE XPERT

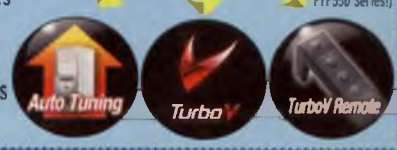
A custom technology allowing you to install up to two drives outside control of the BIOS. This lets you configure one drive for secure backup or two drives for super fast storage.

TURBO V EVO – ULTIMATE PROCESSOR

A real-time overclocking processor that assists both advanced and entry-level overclockers. It allows precise adjustment of voltage and cpu frequencies within Windows, while its auto tuning accelerates the system clock to the most extreme speeds possible while maintaining stability. Being a hardware overclocking processor, it uses up less CPU resources than a software solution.



(Only on ASUS P7P55D Series!)

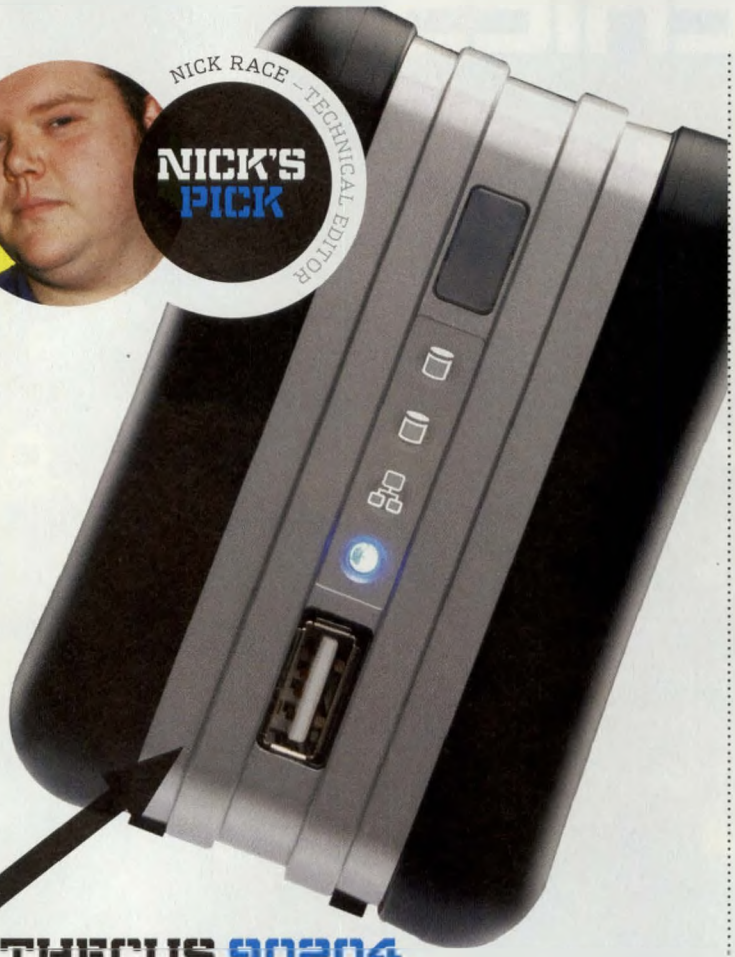


20 thelab

PRODUCT REVIEWS & COMPARISONS

NICK RACE – TECHNICAL EDITOR

NICK'S PICK



THECUS 90204

Insert two 2.5in hard drives into this device and you get a full NAS that fits into the palm of your hand. It's able to configure the drives with JBOD, RAID 0 or RAID 1 array setups and comes with media and iTunes server software for your music, videos and pictures. For downloaders, the N0204 can manage HTTP, FPT and even BitTorrent downloads.

PERFORMANCE ✪✪✪✪

It's small, but it's no slouch. Copying a 2.5GB zip file to the device in RAID0 mode, via a 10/100 Ethernet connection took our reviewer, Bennett Ring, only 4 minutes and 9 seconds.

PRICE ✪✪✪✪

For $229 you get a feature-rich NAS that fits into the palm of your hand. Just add the drives. Perfect for hiding in a cupboard somewhere or ideal for when you're travelling between home networks.

SETUP ✪✪✪✪

The N0204 comes with a one-click setup but will also let you configure it manually if need be. Bennett had the N0204 ready for basic duties in a couple of minutes.

LABS ROUND-UP

INTEL'S NEW CORE i5 CHIP

Intel's new Core i5 processor is destined to replace the Core 2 Duo chips that power many of today's PCs.

42

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An extra-long two-year warranty means the M2010 could be the netbook to bet on.

7/10

Fujitsu M2010 netbook

Tough enough for the kids.

Fujitsu Australia
www.fujitsu.com.au
$749

✔ Excellent warranty; sturdy construction; great battery life.

✖ Cramped keyboard; heavier than most netbooks; average specs.

SPECIAL FEATURES
Rugged construction
10.1in screen
Two-year warranty

Fujitsu isn't a brand that we normally associate with the value segment, instead focusing on the higher-end of the notebook market. So it's quite surprising to see the arrival of the Fujitsu M2010 netbook in the *APC* labs. How will the company's reputation of high quality and bleeding-edge tech gel with a segment usually associated with budget prices and low-fi specs?

Most netbooks abide to a standardised list of components, and the M2010 is no exception. An Intel Atom N280 running at 1.66GHz sits atop the Intel 945GE chipset, alongside 1GB of memory. It's standard netbook fare, and is powerful enough to keep the XP experience responsive and smooth. It handles basic spreadsheets and Word documents with aplomb; just don't expect it to run HD video or games more complex than Tetris.

A couple of components exceed the netbook benchmarks. The six-cell battery provides exceptional battery life, at the price of additional weight (1.3kg), while the 5,400rpm drive is a step up from the usual 4,200rpm netbook drives. Yet this didn't help with performance, with the M2010 slightly slower than competing units.

Targeted at school children, the M2010 will be subjected to more bumps and scrapes than the average netbook. It should be able to handle the rigours of the schoolyard well, as the build quality is exceptional. There's very little keyboard flex, and the whole unit feels sturdier than most of the netbooks we've seen. According to Fujitsu, the lid can withstand a load of 200kg, more than the combined weight of several schoolyard bullies. Fujitsu has put its money where its mouth is, covering the M2010 with a two-year warranty. This is double the warranty of other netbooks, and to many users will justify the M2010's slightly higher price. What's an extra hundred dollars if it means you don't need to buy a new netbook?

The 10.1in screen has a native resolution of 1,024 x 575 and is bright enough for outdoor use. Sitting above the screen is the expected webcam, while a set of stereo speakers are tucked away inside the case. They provide higher-than-average volume, though still don't rival a decent set of dedicated speakers.

The keyboard feels nice and solid but is a little cramped. It might be fine for a child's miniature digits, but adults will find it uncomfortable when used for extended periods. The touch pad is very responsive and accurate, while the two buttons below require above-average force to click.

Three USB ports are included, one more than found on most netbooks. Bluetooth 2.1 is also integrated into the M2010, a surprising addition that may come in handy. We'd have preferred this was left out though, and the money spent instead on better Wi-Fi. Only 802.11 b/g is supported, with no sign of the much speedier 802.11n.

As mentioned before, the M2010 ships with Windows XP Home, which is getting a little long in the tooth considering Windows 7 is just around the corner. Given the modest hardware specs, Vista would be too demanding, but it will be interesting to see whether the M2010 can handle Win 7 with the taxing Aero features disabled.

Considering the specs aren't quite as impressive as some of the newer netbooks in this range, it'd be easy to overlook the M2010. Those who do so would also miss its exceptional build quality and reassuring two-year warranty, making it a safe option for kids who might be a little rough with it.

Bennett Ring

7/10

Toshiba Satellite U500

A stylish, feature-packed notebook.

Toshiba
www.isd.toshiba.com.au
$1,999

Affordable; distinctive design; solid performance.

Limited battery life; small trackpad; noisy.

SPECIAL FEATURES
Discrete graphics
Modern design aesthetic
Multi-touch trackpad

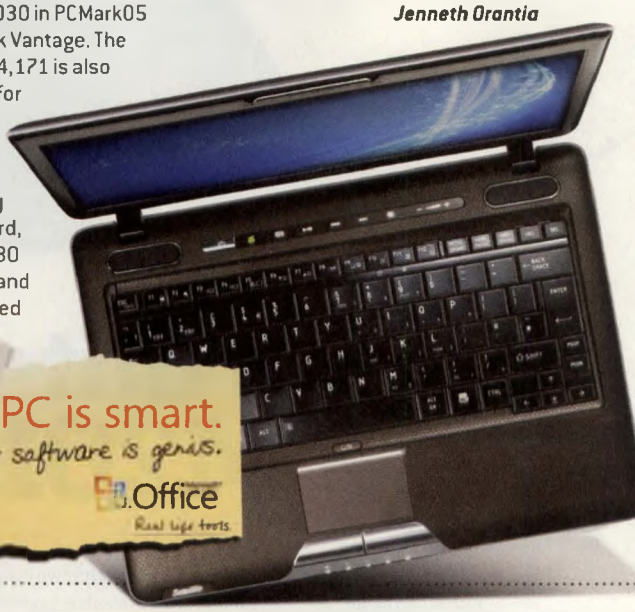
Bargain hunters looking for a stylish and feature-packed notebook will find a worthy machine in the U500. The hero notebook in Toshiba's updated Satellite range, it offers a stable of unique features like an environmentally-friendly Eco utility and a multi-touch trackpad. It also stands out from its stablemates thanks to the distinctive mocha brown 'Luxe' texture on the lid and base.

Measuring almost 4cm at its thickest point, the U500 doesn't fit the classic mould of an ultraportable, but the 2.1kg weight makes it light enough to tote around on a regular basis. The short battery life is what poses more of a challenge to road warriors — it's only good for around two hours of web surfing over Wi-Fi with the power-saving Eco mode enabled, and even less when running in standard mode.

Performance on the U500 is impressive for a mid-range machine thanks to a 2.53GHz Intel Core 2 Duo P8700 processor in the engine room, 4GB of DDR2 800MHz RAM, and an ATI Mobility Radeon HD 4570 graphics card with 512MB of discrete memory. On our standard set of benchmarks, the U500 achieved a well above average score of 6,030 in PCMark05 and 3,699 in PCMark Vantage. The 3DMark06 score of 4,171 is also exceptionally good for this price range.

All the creature comforts you'd want in an everyday machine are on board, from the 13.3in 1,280 x 800-pixel display and comfortable full-sized keyboard to the three USB 2.0 ports, 802.11a/g/n Wi-Fi and DVD SuperMulti optical drive. It's also got a few extras, like the HD webcam, an LED backlit keyboard and a multi-touch trackpad.

Jenneth Orantia



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7/10

Pioneer Dreambook D90 i7

Pioneer jumps the gun.

Pioneer Computers
www.pioneercomputers.com
$5,799 (our spec)

Extremely powerful; good screen.

Heavy; expensive; runs hot.

SPECIAL FEATURES
Core i7 Processor
Three hard disk drives
NVIDIA GTX 280M chipset

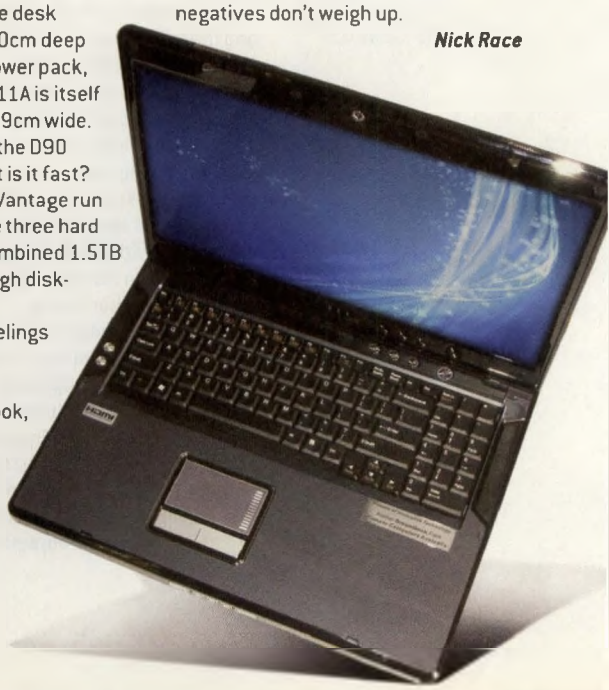
With Intel Core i7 still waiting to be spun out to notebooks with a low power rehash, there's a big gap at the top of the notebook market. The success of the Core i7 (and Nehalem design in general) has everyone waiting with bated breath for the mobile version. But if you really can't wait, here's an option.

Pioneer Computers are selling this monstrous desktop replacement notebook with a Core i7 processor at its heart. The basic specs read like a real desktop: Core i7 950 at 3GHz with 8MB of cache on an X58 chipset-driven mainboard, 6GB of DDR3 1,066 RAM, three 500GB 7,200rpm Seagate hard disk drives (in this case configured as RAID 0), a Blu-ray drive, TV tuner and an NVIDIA GTX280M chip drives the 17in WUXGA screen. Wowzers.

Unsurprisingly, this thing is BIG. It's heavy, chunky and as thick as a bible; chucking it in a backpack isn't really feasible. Lid closed, it sits six and one half centimetres off the desk and is a shade under 30cm deep and 40cm wide. The power pack, which puts out 20V at 11A is itself almost 20cm long and 9cm wide. There's nothing about the D90 that says portable. But is it fast? You bet it is. A PCMark Vantage run clocked it at 7,795. The three hard disk drives with the combined 1.5TB of storage whips through disk-based tests in RAID 0.

We've got mixed feelings about this notebook. It's undeniably fast, especially for a notebook, but its usability is compromised. It's too high off the desk to type comfortably for extended periods; it's heavy and it's hot. It's also not terribly good value. If you can live with these caveats, you'll get a rip-roaring notebook. But for us, the positives and negatives don't weigh up.

Nick Race



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6/10

Sony Ericsson MBW-200

A gadget for well-heeled movers and shakers.

Sony Ericsson
www.sonyericsson.com.au
$849

✔ Displays caller ID; bright OLED screen; music controls.

✖ Expensive; chunky; limited compatibility.

SPECIAL FEATURES
- OLED display
- Bluetooth personal area network

If you're constantly missing calls on your mobile while you're out and about, and you happen to own one of a limited selection of supported Sony Ericsson mobiles, the MBW-200 Bluetooth watch can help. The MBW-200 doesn't look any different to a regular wristwatch, but as well as telling the time with an analogue clock face, it interacts with your phone over Bluetooth to display incoming caller ID, alert you to new text messages, and let you control music playback.

The MBW-200 is pitched as a lady's watch, but the 'Modern Elegance' style we received for review, which consists of a plain black leather strap, black face and silver frame, looks more like something a man would wear — not least because the timepiece is a fair bit chunkier than the typical lady's watch.

Most of the action takes place on the small 80 x 60 OLED display on the MBW-200's face. When a call comes in, the watch vibrates softly and the caller ID is displayed on the screen — if that person is in your address book, you'll see their name come up instead.

The OLED display also shows song names when you're playing music. You can mute or reject incoming calls, and buttons on the left side are dedicated to music playback. The MBW-200 displays an envelope icon when you get a new text message, but we would've preferred if it displayed the name of the sender as well.

We like the idea of the MBW-200, but the pricetag seems disproportionate to the functionality. Most likely, it costs more than the phone you're connecting it to, and worse, it doesn't even look like an eight hundred and fifty dollar watch.

Jenneth Orantia

7/10

LG Xenon

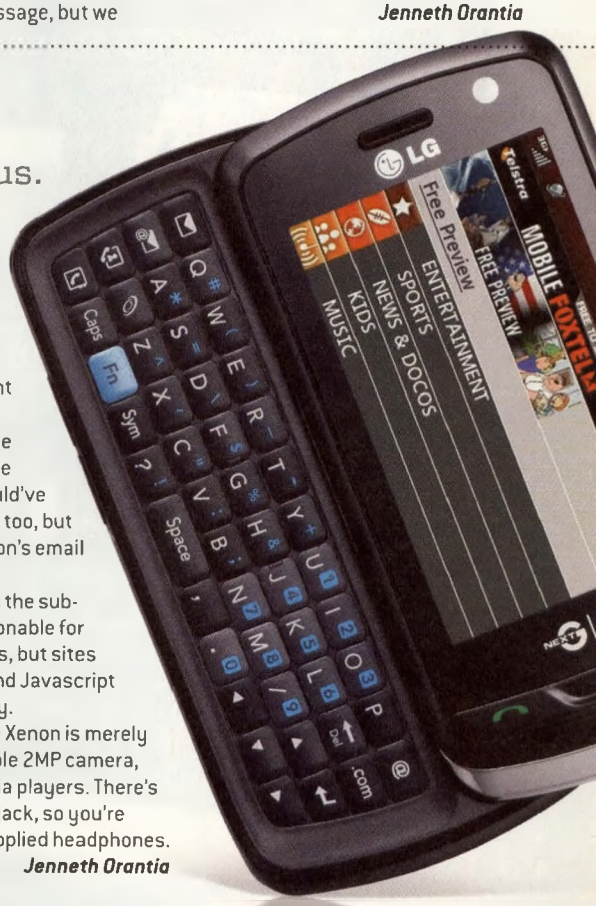
The smartphone for the rest of us.

Telstra
www.telstra.com.au
$589

✔ Excellent QWERTY keyboard; compact; affordable.

✖ Limited web browser; proprietary headphone jack; no Wi-Fi.

SPECIAL FEATURES
- Full QWERTY keyboard
- Touch interface
- 2MP camera



Next to other QWERTY sliders like the Nokia N97 and the HTC Touch Pro2, the LG Xenon is a tempting alternative. It's got the same touchscreen and slider keyboard, but it's considerably smaller, and it comes in at half the price ($589 prepaid through Telstra).

That said, the Xenon isn't a smartphone, so if you're looking for functions like Exchange sync, third party apps, or even Wi-Fi, you're barking up the wrong tree. The Xenon is an entry-level feature phone in a fancy smartphone's clothing, with a Java-based LG proprietary OS and built-in apps that cover the bare basics.

The Xenon's plain lines and black plastic shell aren't much to look at, but it's a lot more pocketable than other phones in its class. Compared to the N97 and Touch Pro2, for instance, the Xenon weighs in at an airy 108g. A 2.8in resistive touchscreen with a 240 x 400-pixel resolution sits on the front, and sliding it to the right reveals the full QWERTY keyboard.

The keyboard is a pleasure to use thanks to the raised keys and excellent tactile feedback, and combined with a decent SMS client, it makes the Xenon a good phone for habitual texters. The QWERTY keyboard would've been perfect for email, too, but unfortunately the Xenon's email function is too basic.

Another let-down is the sub-par web browser: reasonable for simple text-based sites, but sites with lots of graphics and Javascript load abominably slowly.

For multimedia, the Xenon is merely average. It's got a simple 2MP camera, microSD slot, and media players. There's no 3.5mm headphone jack, so you're limited to using the supplied headphones.

Jenneth Orantia

7/10

HP TouchSmart

Get all touchy feely with the TouchSmart IQ545a.

HP
www.hp.com.au
$2,299

Great touch functionality; nice aesthetic.

Low-end graphics limits flexibility; limited AV output.

SPECIAL FEATURES
22in wide touchscreen
All-in-one unit
Manage your family affairs

The touch revolution is in full swing. First it was old-school touchscreen monitors, then mobile phones, now PCs are at it again. With the impending launch of Windows 7 and the full touch functionality built in to the OS, we're bound to see a whole new generation of touchy feely computers.

The TouchSmart series, launched in 2007, is designed from the ground up to be a family PC. Not just a PC for the family to use, but a device that can be placed in, and become the centre of, an organised home. Correspondingly the IQ545 is pretty rugged and well balanced, meaning you won't be tipping it over with some overexcited touching. The interface has seen some refinements since the original TouchSmart. While functionality has been added, like a full-blown media centre front end, the basics remain the same. Included is a photo viewer, a calendaring system (which can now sync with Google calendar as well as Outlook, including multiple accounts) and a notes section, where quick post-it type scribbles or audio notes can be left for household members (or a single forgetful user!).

The hardware has also seen a bump, with the 545a sporting a Core 2 Duo M T6500 on a GM45 Express chipset. Onboard Intel GMA4500MHD graphics with 128MB of RAM looks after 3D and is probably the most disappointing part of the whole machine. Considering its general purpose as a full family PC, it's not inconceivable the kids (or the grown-ups) would like to play the odd game; and that's going to be pretty painful with the GMA4500. Mixed in is a 320GB hard disk drive, Wi-Fi, a built-in TV tuner, premium stereo speakers and a 5-in-1 memory card reader.

The unit is shipped with a wireless keyboard and mouse. The mouse is fine, but the keyboard is a step back. Flat to the desk and too thin for comfort, it's more like an out of place notebook keyboard without the handy wrist rest. Yuck.

The 22in screen makes up for any huge flaws in the recipe. It's lovely to look at, and doesn't suffer from that vaguely muted look you get from some touchscreens. Fingerprints don't seem to be a huge issue either, but keep a glasses cloth close by just in case. The display runs just short of 1,080 high definition at 1,680 x 1,050 native resolution, which is a little disappointing. An HDMI output would have been nice to pair with the TV tuner and media player functionality to output to a bigger screen as well.

So what's the verdict? If you're keen for a PC to manage your family or flatmates, then this could work for you. If you're thinking of ditching your desktop for something more central, then depending on your requirements (ie. you don't play any games) then it could fit as well. Considering this machine's placement at the centre of the home, we're a little disappointed by the lack of serious graphics and inability to use a bigger screen.

Nick Race

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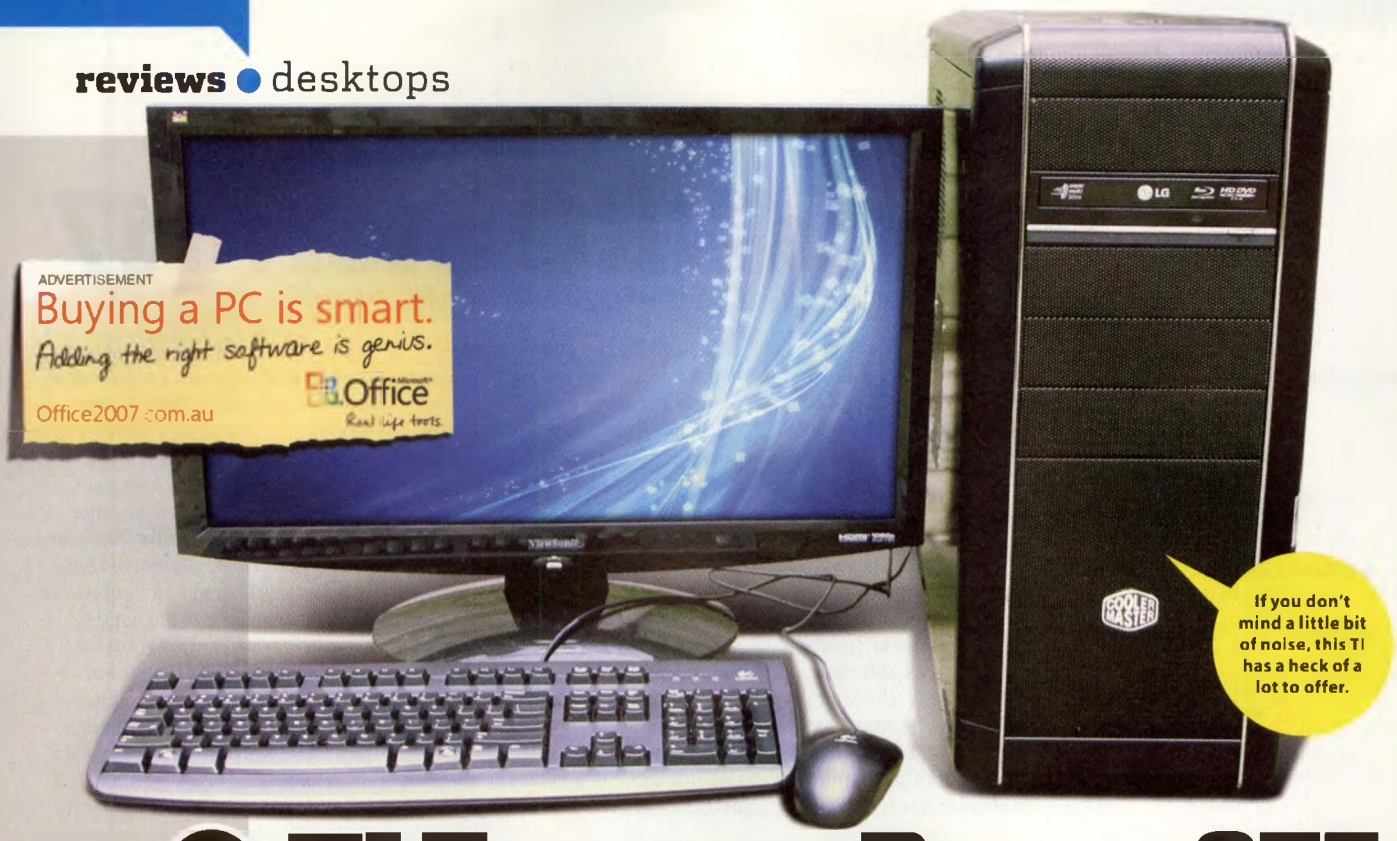

8/10

TI Extreme Power 975

As good on the inside as it looks on the outside.

TI Computers
www.ticomputers.com.au
$4,995

Looks good; huge hard disk storage; fast at everything.

Noisy.

SPECIAL FEATURES
Intel Core i7 @ 4GHz
RAID 0 performance
Top-of-the-line graphics card

APC MAGAZINE HIGHLY RECOMMENDED apc

TI Computers has always impressed us by building fast machines at budget prices. The company tends to spend time and effort on the insides of PCs while using functional-rather-than-flashy cases and peripherals. But this machine is different. Coming in at a cut under five grand, it's the most expensive TI PC we've ever seen. And, for once, it looks expensive too.

First up is the Cooler Master 690 case. While not quite a full tower, it's big and imposing and looks great thanks to a metal mesh front and top coupled with silver trim and internal blue LEDs shining through. On top of this is the classy monitor: a 24in (actually 23.6in) Viewsonic widescreen with a 1,920 x 1,080 resolution and consequent 16:9 aspect ratio. It looks glossy and the display is bright, crisp and evenly lit.

It's got some nifty features too. In addition to the regular DVI and VGA ports, it's got HDMI and speakers built in too. Despite grand claims, they're not a replacement for a decent set of stereo units, thanks to an abject lack of bass. But they get quite loud and are fine for things like Windows pings and YouTube clips.

The only visual disappointment is the Logitech keyboard and mouse. These are very plain and low-end although they function just fine. We'd expect a little luxury at this price.

Inside everything really hots up. TI uses Intel's fastest processor, the 975 Extreme. This is overclocked from 3.33GHz up to 4GHz and cooled with a hefty heatsink and 120mm fan combo, which kept it stable through our torture tests. Three sticks of 2GB G.Skill PC12,800 DDR3 RAM are included, running in triple-channel, and the boot drive is made up of two 150GB WD VelociRaptors running in RAID 0. All of this is rooted in Gigabyte's popular EX-58-Extreme motherboard, which is a proven rock of stability (plus mighty overclocker). All together the components combined to score 8,206 in PCMark Vantage — not quite as fast as we were expecting, but few will grumble with its real-world performance at hardcore tasks like video editing.

TI also bundles the brilliant Nvidia GTX 295 graphics card. This is the fastest around with two GTX 200 GPUs on a single card. In 3DMark Vantage it scored 22,401, showing it will happily play all of the latest games.

In general use, there were only a few occasions when application start times weren't instantaneous. However, it didn't feel as nippy as Altech's three-grand-dearer NRG system.

Other features include two 1TB Samsung hard disks to take care of all your media storage needs. There's room for three more if you really want, too. TI also includes an optical drive, which supports both Blu-ray and HD-DVD. While the latter is somewhat defunct, you're still able to find some HD movies at bargain-bin prices on the web.

Connectivity is good, with the usual two USB ports and two audio jacks at the front of the case (on the top) being joined by FireWire and eSATA. The motherboard provides eight more USB ports (two PS/2 ports take care of the keyboard and mouse), optical and coaxial S/PDIF out, FireWire and two gigabit LAN ports at the back. There's no eSATA there though.

Our only real issue with this system is the noise. It's not quiet. Most of the din comes from the case's exhaust fan, and even though a dial can reduce the RPM it's never quiet. However, if you can put up with a bit of noise, this is a hugely-powerful PC at a respectable price that will fulfil gamers' and power users' needs alike.

Nick Ross

9/10

Altech NRG Storm i7

Serious speed with a pricetag to match.

Altech
www.altech.com.au/nrg
$7,899

Crazy-fast; looks good. ✔

Noisy; small hard disk; small warranty. ✖

SPECIAL FEATURES i
Three solid-state disks
4.25GHz overclock

APC MAGAZINE apc EDITOR'S CHOICE

Another month brings another beast of a machine from Altech's popular NRG range. While the imposing Antec Twelve Hundred 'Ultimate Gaming Case' might be familiar, many of the inside components are not. And whereas previous review units have suffered from early BIOSs and flaky engineering samples, this latest system sports the latest kit and it all runs very sweetly indeed.

Inside is Intel's fastest Core i7 975 processor. At stock, this runs at 3.33GHz, but thanks to a range of water-cooling products, Altech has it running stably at 4.25GHz. Cooling it down is an Alphacool system that has, at the front of the machine, a digital display giving you status updates and, below that, a glowing, fluorescent reservoir of coolant.

Flanking the processor are three sticks of 2GB Corsair DDR3 RAM, which have been tweaked and tuned enough to require their own dual-cooling fan system. Along with these are three 64GB Super Talent UltraDrive solid-state hard disks running in RAID 0. While they may only offer 192GB of storage space (178GB formatted) they do offer some severe speed.

Providing both the icing on the cake as well as the cherry and a layer of gravy to boot are two Gigabyte Nvidia GeForce GTX 295 graphics cards. Both of these have two processing cores and 1,792MB of memory, meaning it's a Quad SLI system. Everything is fixed into a Gigabyte EX58-Extreme motherboard, which is a proven stable performer and holder of overclocking world records. Power comes from another solid performer, the Antec 1000W TruePower Quattro PSU.

Previously, when we've run our benchmarks on these systems we've been disappointed — but not this time. In PCMark Vantage it scored a whopping 12,904. If you're into hardcore encoding, or any other 2D apps, this will fly along... although you'll almost certainly need to add a large 'tank' hard disk to contain your regular media files and documents.

In 3DMark Vantage it scored a massive 36,127, meaning it won't be slowing down for anything you can dream of throwing at it for some time yet. Quite simply, this is the fastest machine we've ever seen. Under day-to-day usage, there's nothing we could do to make it pause at all.

But speed comes at a price. One of those prices is noise. With a 200mm top fan, the two internal small RAM fans, three front-mounted 120mm fans, a side-mounted 120mm fan plus two more at the back, it's not quiet, even when idling. You can barely hear the soft buzz of the water-cooling.

Features include a Sony Blu-ray drive and a full complement of connectivity. At the front (top) there are two USB ports, eSATA plus the usual two audio jacks. At the back are eight more USB ports, two Gigabit Ethernet ports, FireWire, six audio jacks, optical and coaxial S/PDIF out ports but no eSATA. On the graphics cards are four DVI plus two HDMI ports.

Inside, despite the mammoth case, there's only room for two additional hard disks thanks to the cooling system and graphics cards. But frankly, what else would you want to add? The whole unit looks fantastic, and the judicious use of blue LEDs and fluorescent lights (and green coolant in clear tubes) adds to the effect. Our main gripe is the usual, paltry one-year RTB warranty, but this is usual for pre-overclocked systems.

Nick Ross

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your barriers with Xtreme Speed

OC Genie

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- Auto detect overclocking setting of CPU and Memory

1 sec overclocking
OC GENIE
Auto Overclocking Processor
msi

SuperPipe

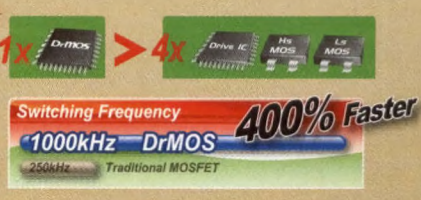
50°C Lower temperature

- The thickest 8mm heatpipe
- 90% better cooling efficiency

DrMOS

1 Phase DrMOS > 4 Phase Std. MOSFET

- 400% faster than standard MOSFET
- Excellent power-saving and OC stability



www.msicomputer.com.au

7/10

Gigabyte 9800 GT SC 1GB

Silent running for HTPC enthusiasts.

Gigabyte
www.gigabyte.com.au
$159

Silent; excellent quality; low power; native HDMI.

Pricey; card length; limited appeal.

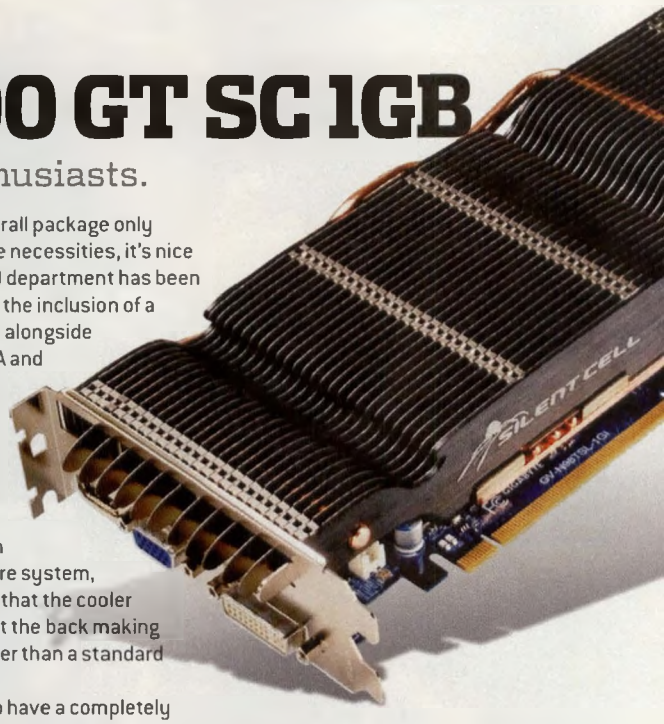
SPECIAL FEATURES
Passive cooling
Runs silent

Nvidia has jumped onto the green bandwagon with its low-powered graphics cards. Instead of making new models though, it has released two older chipsets to fill this niche. The first was the 9600 GT, which just doesn't have the power for many users; the second is the slightly snappier 9800 GT. Gigabyte has taken the 9800 GT and whacked a massive heat sink onto it, under the Silent Cell moniker. This passive cooling solution makes the card completely silent. But due to the limitations of a passive cooler, it's no surprise that Gigabyte has chosen to keep with the reference specifications. This means the core comes in at 600MHz while the 1GB of GDDR3 carries with it an 1,800MHz DDR clock speed. On the performance side the card is lacking compared to high-end (and noisy) gaming cards. While 1,280 x 1,024 shouldn't be a problem in older games, newer ones like Far Cry 2 will struggle.

While the overall package only includes the bare necessities, it's nice to see that the IO department has been attended to with the inclusion of a native HDMI port alongside the standard VGA and DVI. While the silent cooler and connectivity might make it look like an attractive option for a home theatre system, it's worth noting that the cooler does overhang at the back making it quite a bit longer than a standard 9800 GT.

If you want to have a completely silent system for a computer where intensive 3D applications aren't a necessity, the 9800 GT Silent Cell from Gigabyte is a good option. On the other hand, if you're happy to buy something second hand and you don't mind a spinning fan, there are better value options. There is a user base who will love the quality, enjoy the warranty and the performance, but it's always going to be a niche market.

Shane Baxtor



7/10

Sapphire HD 4890 X Vapor-X

New cooler, but not that cool.

Sapphire
www.sapphiretech.com
$424

Quick; 1GB version available; good bundle.

2GB of memory not that useful; pricey.

SPECIAL FEATURES
2GB GDDR5
Aftermarket cooler
Reduced noise

The AMD ATI HD 4890 is a good card. From the time it launched, it never offered the huge performance we thought it would, with ATI concentrating on making it a great-value card. While this strategy was appreciated by many people, the 4890 was not going to bring the performance crown for ATI.

Sapphire recently released the "Atomic" version of the HD 4890, which sported a big cooler and bigger clock speeds. With a default core of 1,000MHz the card became a force to be reckoned with. Jump forward to now and we have another variant on offer, carrying not only Sapphire's new Vapor-X cooling setup but an overclocked core and memory speed and double the GDDR5 RAM at 2GB.

The core has been bumped up from the stock 850MHz to 870MHz. Also pushed north is the memory clock, which now comes in at 4,200MHz QDR rather than the stock 3,900MHz QDR.

Looking at the card's performance, compared to that of a stock-clocked 1GB model, we see a nice jump at all resolutions in all games — but how much extra performance the faster memory clock gives us is harder to quantify, though it sounds nice.

With a decent bundle that includes some CyberLink software and a full version copy of 3DMark Vantage, Sapphire has a pretty good deal on offer. Carrying the Vapor-X name also means the cooler has been upgraded, and while core temperature was up 10 degrees C when compared to the stock cooler, noise levels were down a good 10dBs.

Shane Baxtor

8/10

MSI N260 GTX Lightning BE

More bling for your buck.

MSI
www.msicomputer.com.au
$339

Performance; initiative; flashy lights!

Expensive; AirForce doesn't fly.

SPECIAL FEATURES

Breakout box for overclocking on the fly
Fast out of the box

Right from the start, everything about the N260 GTX Lightning Black Edition from MSI is flashy. Remove the box cover and you find yourself staring at something that looks like a treasure chest: the bottom has a tray that packs all the accessories while the top opens up and reveals the graphics card along with a nice added extra, a 5 1/4in panel that can sit inside or outside your computer and gives you the ability to adjust the speed of the N260 GTX on the fly.

Called AirForce, the panel also carries a number of presets like game, office and power saving modes, which move you to a certain speed and power configuration with a single press of a button. AirForce is a bit more limited when it comes to adjusting clock speeds, since the software can only give small adjustments to the core, shader and memory. It must be said, though, while the device does look great, once you start playing a game the last thing you're going to be worried about is adjusting your card's clock speeds.

Out of the box the card carries a 650MHz core, up from 576MHz, while the 1,792MB of GDDR3 comes in at a rounded-up 2MHz to give us a solid 2,000MHz DDR clock. With the "game mode" initiated on, the AirForce panel clocks are increased to 680MHz on the core and 2100MHz DDR on the memory.

In reality, the AirForce device is a bit of a pain to use – but it's nice to see MSI think outside of the box, and you get the "wow" factor of having more flashy lights on the front of your computer to impress your friends with.

Shane Baxtor

9/10

Inno3D GTS 250 Pro OC iChill

Overclocked and chilled right down.

Inno3D
www.inno3d.com
$200

Excellent bundle; good performance.

SLI not an option.

SPECIAL FEATURES

Arctic Cooling TwinTurbo pro cooler
1GB GDDR3
Overclocked

Nvidia's GTS 250 graphics card has been a popular model due to its good performance-to-price ratio. As time has passed, performance has only got better, with partner companies putting their own stamp on the design while dropping the price even further. The latest company to mix it up with the GTS 250 chip is Inno3D, and they've slotted it into the iChill series.

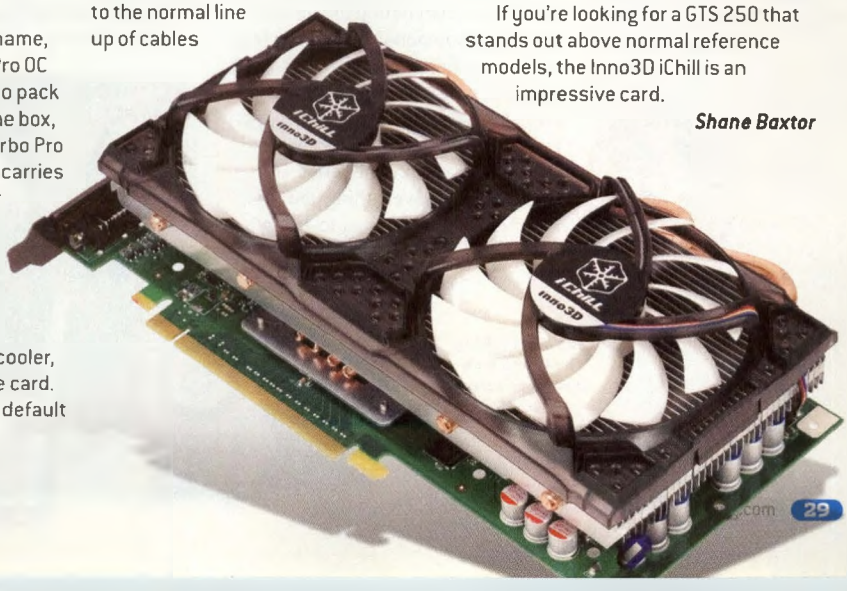
While sporting an unwieldy name, the Inno3D GTS 250 TwinTurbo Pro OC iChill FreezerX series manages to pack some serious features. Out of the box, Inno3D has opted for the TwinTurbo Pro cooler from Artic Cooling, which carries two 92mm fans and four copper heat pipes. Worth noting is the fact that the cooler does prevent you using the SLI connectors due to the height of the unit.

In addition to upgrading the cooler, Inno3D has also overclocked the card. While the shader remains at the default 1,836MHz clock the core has been increased from 740MHz to 760MHz. The 1GB of GDDR3 memory comes in at 2,240MHz DDR, which is way up from the stock 2000MHz clock we normally see from this model.

If the card features alone weren't enough to get you excited, Inno3D has really added to the bundle. In addition to the normal line up of cables and software, also included are two full-version games: Warmonger and FarCry 2. The bump in clock speeds makes the card up to 10% faster than stock GTS 250s. Of course, where the model really shines is in the cooling department; with temperatures being around 7c down with the same noise levels as a reference card.

If you're looking for a GTS 250 that stands out above normal reference models, the Inno3D iChill is an impressive card.

Shane Baxtor



6/10 Creative Gigaworks T3

Loud, but not that good.

Creative Labs
au.creative.com
$399.95

Tiny satellites; stylish. ✔

Overpriced; mediocre sound performance; no digital inputs. ✖

SPECIAL FEATURES
Compact and stylish stereo satellites
Remote volume control and inputs
Energy Star rated

At nearly $400 for a pair of computer speakers described by Creative as having audiophile-quality drivers, we expected something special.

Appearance-wise they are cute, standing 15cm tall on their little stands — great for cluttered desktops and places where you want sound rather than speakers. The subwoofer is a 6kg box that is best put on the floor but again it is not too bulky. All of the connectors are at the back of the subwoofer. Volume is controlled by a dome shaped pod that plugs into the back of the subwoofer and also provides an auxiliary 3.5mm stereo input and headphone socket. It is definitely stylish! Unfortunately, inputs are analogue only.

For the size of speakers, the Gigaworks T3 system can put out a lot of sound, and if they were priced reasonably we would have been satisfied. However, at this price point (which is what you would pay for a reasonable pair of hi-fi speakers), we expected outstanding sound and we were disappointed.

The subwoofer would be best described as a woofer because it was unable to properly reproduce room-shaking low-frequency effects. The bass bombed out at around 35Hz, which is not good. The satellites did a fair job of reproducing mid-range tones but were lacking in clarity and crispness in the high-frequency range, again our tests indicating they were struggling to cope with sounds above 15kHz.

As long as you listened to simple music, the sound was acceptable (but nothing special), however, auditioning something more complex such as choral and organ works quickly showed up deficiencies.

If you want cute speakers, these are better than average for computer speakers, but don't buy them for high-quality music reproduction.

David Neiger

8/10 Logitech Z5500

You'd be hard pressed to find better.

Logitech Australia
www.logitech.com
$699

DTS and Dolby Digital surround support; room-shaking bass. ✔

No HDMI input. ✖

SPECIAL FEATURES
DTS, Dolby Digital and DTS 96/24 5.1 speaker system
Remote control and external IO box

If you have the cash to splash then you will be hard pressed to find a better set of computer speakers. The Z5500 is a true 5.1 surround speaker system comprising an enormous (and heavy) 10in long throw subwoofer, a centre speaker and four other speakers: a pair of front and a pair of satellites.

The amplifier is built into the subwoofer, eliminating the need for additional components or power for speakers. The whole set is controlled from a separate wired control pod (with infra-red remote) which plugs into the back of the subwoofer.

The out-of-box experience is excellent, as everything you need included with easy-to-follow instructions. There are three sets of 3.5mm stereo jacks, coax and optical digital inputs and an additional stereo input. The unit itself decodes DTS, Dolby Digital and DTS 96/24 so you can stream digital audio directly from your PC or Blu-ray player. The Z5500 also accepts 96/24 PCM audio if you prefer to use a separate decoder.

Sound quality is very good for PC speakers and is better than some mid-range home theatre systems we have auditioned. The surround field is spacious and precise, which really enhances the gaming experience. If you want to listen to music or watch movies, you will find the sound to be well balanced and clear although not quite in the league of our audiophile reference speakers. The Z5500 coped well with all musical genres.

Our only criticism is that we would have expected an HDMI input, but aside from this minor niggle, the Z5500 is a great set of computer speakers.

David Neiger

Room-shaking bass and well-balanced sound: the Z5500.

9/10

Thecus N0204

Is that a NAS in your pocket?

Thecus
www.thecus.com
$229

Small; simple to use; solid performance; feature-packed.

Web interface could be better implemented.

SPECIAL FEATURES
Can act as a print server
Webcam-compatible
Embedded Media Server

NAS or nano? With the Thecus N0204, you get both.

The Thecus N0204 offers the convenience of a dedicated NAS device in a package that fits into the palm of your hand, and won't set your wallet on fire. Note that the price tag doesn't include the 2.5in hard drives that the N0204 houses. It's got two vacant drive bays and, once both are filled, offers JBOD, RAID 0 or RAID 1 array.

Setting up the N0204 is a breeze. The installation software offers a one-click setup, while a manual setup sequence delivers a more tailored experience. Either way, you'll have the N0204 ready for basic file serving duties in less than two minutes. However, unlocking all of its potential will take a lot longer — it's feature-packed.

The inclusion of Macrovision's DLNA-compliant Embedded Media Server makes it the perfect distribution point for your music, videos and pictures. It also includes iTunes server functionality. If you're a heavy downloader, the N0204 can take care of your HTTP, FPT and even BitTorrent downloads. Just point it at the target URL or torrent file and it does the rest. You can even schedule the download to occur during off-peak hours.

It even offers a cheap security system when paired with a webcam. Using the USB 2.0 port on the front of the chassis, plug in a USB webcam, set up the N0204 to capture images, and film your untrustworthy nanny. Plug a printer into the same USB port and you've got a printer server instead. All of this functionality is provided via a simple if somewhat drab web interface.

It's remarkable to see all this functionality offered in a package that fits into the palm of your hand, and our performance tests showed that it's no slouch either. Copying a 2.5GB ZIP file to the device in RAID 0 mode, via a 10/100 Ethernet connection, took only 4 minutes, 9 seconds. As a result, we have absolutely no hesitation in recommending the N0204 for those who need an affordable, feature-rich and easy-to-use NAS device.

Bennett Ring

7/10

HP LaserJet P2055dn

Fast to start but slow to finish.

Hewlett-Packard
www.hp.com.au
$799

Gigabit Ethernet and duplexer as standard; fast start-up.

Distinctly slower than claimed.

SPECIAL FEATURES
PostScript and PCL
Fast start-up

Looking for a monochrome laser printer for a small workgroup? HP thinks the P2055dn hits that spot.

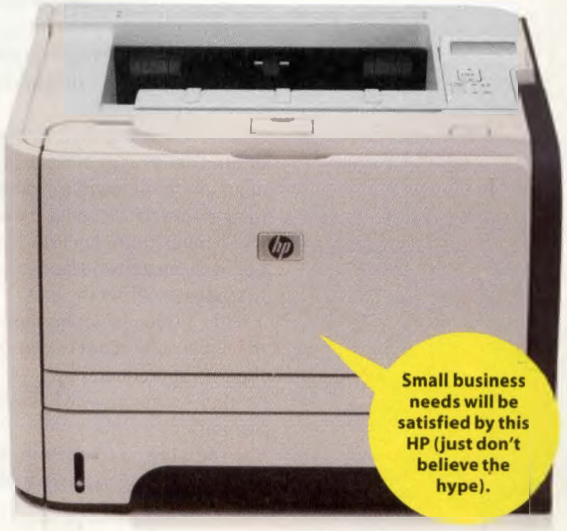
As usual, the dn suffix means a duplexer and a network interface (Gigabit Ethernet) are fitted as standard, in addition to the usual USB 2.0 interface. The installer CD presents animated setup instructions before proceeding with software installation. Although the P2055dn includes PCL and PostScript, the Windows installer goes for PCL without offering a choice.

The main piece of supporting software is ToolboxFX, which reports device status and allows more convenient configuration than the printer's two-line LCD. Similar information and controls are available via a web interface. Optional software comprises Easy Printer Care (a management tool for small numbers of printers) and Smart Web Printing. Bonjour support simplifies Mac OS X installation (PostScript only), although the print queue must be added manually.

The P2055dn scores bonus points for being ready for action just a few seconds of switching on, without the usual prolonged clunking and whirring. It produced the first page of our business document in 15 seconds, with page two following 3 seconds later. And we're not convinced by HP's claim of an eight-second first-page-out time, as even a blank page took 14 seconds to emerge.

The text quality was very good on the default FastRes 1200 setting but took on an even finer appearance with ProRes 1200. Graphic elements also improved, with finer and therefore less noticeable dot patterns as well as better contrast for fine light-coloured lines against dark backgrounds.

Stephen Withers



Small business needs will be satisfied by this HP (just don't believe the hype).

8/10 Philips 240PW9

Rich and vibrant colours.

Philips
www.philips.com.au
$999

Brilliant image quality. ✔

HDMI would have made it complete. ✖

SPECIAL FEATURES *i*
5ms pixel response
Tilt & height adjustable stand

The Philips 240PW9 monitor has an incredibly vivid display. As soon as we powered this screen on we were struck by the colour depth and richness.

While most LCDs require some assembly of the base and screen, the 240PW9 is ready to go straight from the box. Connectivity is covered by either VGA or DVI. The lack of HDMI isn't surprising as the 240PW9 is targeted at business users, but might be a concern for those looking to use the 240PW9 as part of a media centre.

There's generous tilt and height adjustment, with the 240PW9 able to be rotated between portrait and landscape modes. If you work with documents or do a lot of page layout work you can have a large view of a single page on the screen when in portrait or two pages adjacent to each other when in landscape.

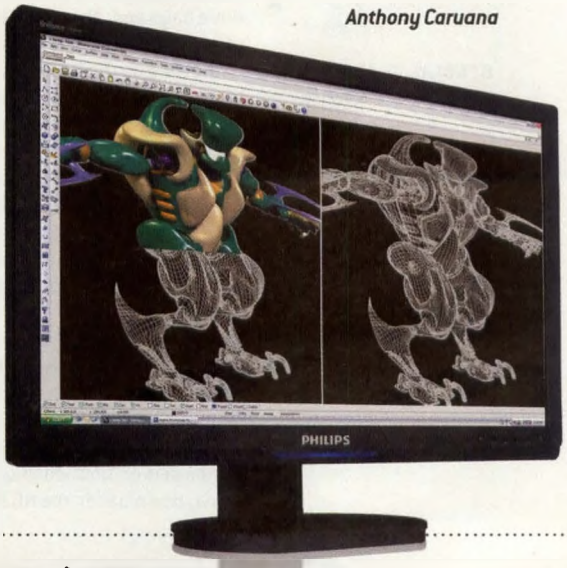
Benchmarking with Passmark's MonitorTest backed our real-world testing — this is a great screen. Obliques and arcs and all the colour patterns rendered perfectly. While many displays bump up the brightness to improve image quality, the 240PW9 delivers rich, vibrant colours without cranking the brightness level all the way up.

Rated at 5ms, the 240PW9 had no trouble keeping up with fast-moving action scenes. When watching recently produced animated and live action movies we couldn't spot any ghosting, although hard-core gamers may prefer a faster-rated panel.

Philips decides claims for dead or stuck pixels on a case by case basis within the three-year warranty period. In other words — it's up to Philips as to whether a dead or stuck pixel warrants repair, replacement or no action.

There's a lot to like about the Philips 240PW9. Colour quality and adjustment options make this a great display for the office. Although it's not the cheapest display on the market, it delivers on most fronts.

Anthony Caruana



6/10 AOC Angelo 2434Pw

Design flair but needs work.

AOC
www.aocmonitor-anz.com
$399

HDMI input; looks great. ✔

No DVI connector. ✖

SPECIAL FEATURES *i*
Advanced design
Full HD video resolution
Touch-sensitive menu

AOC might be a new kid on the block but they've hit the ground running with a wide array of displays for just about every type of consumer.

The Angelo's connectivity is covered with VGA and HDMI ports hidden behind some panels on the back of the screen. There's no DVI connector, so purchasers may need to factor in a DVI-HDMI cable. The power cable is also hidden away, to minimise cable clutter.

Ergonomically, the 2434Pw offers a good range of tilt and height adjustment, although we found the mechanism a little fiddly. It would be nice if the 2434Pw could be flipped between portrait and landscape so that folks could get the most from the 1,920 x 1,080 resolution. Clearly, this resolution is all about HD video rather than office productivity.

Benchmarking with PassMarks's MonitorTest and our real-world testing showed it to be a competent display. Ellipses and diagonals were displayed almost perfectly, and different colour patterns were clear. The 2ms panel dealt easily with fast-moving images.

In keeping with its sci-fi styling, the 2434Pw has a set of touch-sensitive regions on the lower edge of the bezel for adjusting contrast, brightness and other settings. While the power button worked we couldn't activate the configuration menu for some reason, so couldn't adjust the screen optimally for our test environment.

AOC's dead pixel policy is not straightforward. It covers either a total of five defective pixels, three stuck or dead pixels or one defective pixel within 10mm of another.

The AOC 2434Pw looks great, delivers excellent image quality and offers a good range of adjustment options. However, trouble with the configuration menu and the lack of direct DVI input are something of a letdown.

Anthony Caruana

6/10

Belkin Powerline Turbo

Do away with the blue cables.

Belkin
www.belkin.com/au/
$179.95

No home renovation skills required to set up a network. ✔

Your mileage will vary depending on the quality of your wiring. ✖

SPECIAL FEATURES
No expensive wiring drops
Plug and play
Perfectly portable

Power Over Ethernet allows you to use your home's electrical wiring as an alternative to Ethernet cables. Simply plug an adaptor into each power outlet and you've got a makeshift network connection between the powerpoints. When Wi-Fi can't reach, or installing Ethernet cables is too expensive, PoE can be a cheap and easy alternative. We say can, as it's not always guaranteed to work. The performance of PoE varies and is reliant upon your home's electrical wiring. This fact became crystal clear when we tested Belkin's Powerline Starter Kit.

Once both adaptors are plugged in, a small light on each adaptor signifies that they've established a network link. To test the speed of the kit we plugged each adaptor into a separate PC. A manual copy of a 1GB ZIP file between the PCs was run three times to minimise variance. Once this test had been completed, we also ran a program called LAN Speed Test, a freeware app created by Tutosoft.

To our dismay, even though the distance between the powerpoints was minimal, the manual file copy recorded a network speed of 8.5Mbit/s. This is a far cry from the kit's advertised 85Mbit/sec, and much slower than our existing 802.11g WLAN. We then ran LAN Speed Test, which backed up our observations. It reported a write speed of 8.18Mbit/s, and a read speed of 9.79Mbit/s.

After scouring the net for other people's experiences, we're convinced that our poor result is due largely to questionable wiring in the test abode. Many other folks report speeds greater than 50Mbit/s.

If you're in a newer home with clean wiring, we're confident that you'll get excellent results, and at only $180 it's a lot cheaper than installing Ethernet outlets. However, if you're in an older or renovated property, ensure the place of purchase allows for refunds.

Bennett Ring

9/10

Billion BiPAC 7404VNPX

Don't judge the kit by its cover.

Billion
www.billion.com.au
$479

Performance; wireless range; 3G fallback. ✔

Ugly. ✖

SPECIAL FEATURES
3G and ADSL
802.11n
4-port Gigabit switch

APC MAGAZINE apc EDITOR'S CHOICE

Thin, sexy, elegant — none of these words can be used to describe the Billion BiPAC 7404VNPX. In fact, the 7404VNPX looks like it belongs on the set of a 1960's sci-fi movie, but under its skin there's an ADSL router that can also handle a 3G connection, a 4-port gigabit router, 802.11n wireless and VoIP. And we all know that it's what's inside that counts.

Setup was straightforward. The installation app on the accompanying CD detected the 7404VNPX although it did rely on having either an ADSL or 3G connection. Our preference is to set up the internet connection after the router is secured, but this can be worked around by accessing the router directly by web browser rather than using the installation utility.

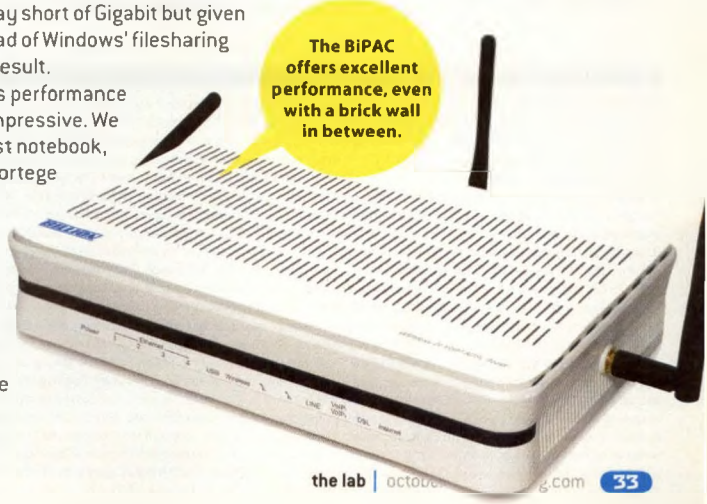
Having both ADSL and 3G makes this a great router for those who need to set up ad hoc networks for events. For the office-bound, craving reliability, the 3G can be used as a failover so that if ADSL goes down, 3G automatically kicks in and you stay connected. The 7404VNPX supports 3G from all the major telcos and iBurst.

Performance was excellent. 480MB of files shipped between systems running Vista in about 28 seconds — that's not much different to copying the same files to a USB 2.0 hard drive. That works out to be about 140Mbit/s — a long way short of Gigabit but given the overhead of Windows' filesharing it's a good result.

Wireless performance was very impressive. We took our test notebook, a Toshiba Portege R500, for a walk and it wasn't till we were about 15 metres away before the signal dropped from "Excellent" to "Very Good". Even with a solid brick wall between us and the 7404VNPX, the signal remained "Fair" and we didn't drop a single packet in our ping test back to the router.

The Billion 7404VNPX mightn't win any beauty contests, but this is a router that ticks almost all the boxes.

Anthony Caruana



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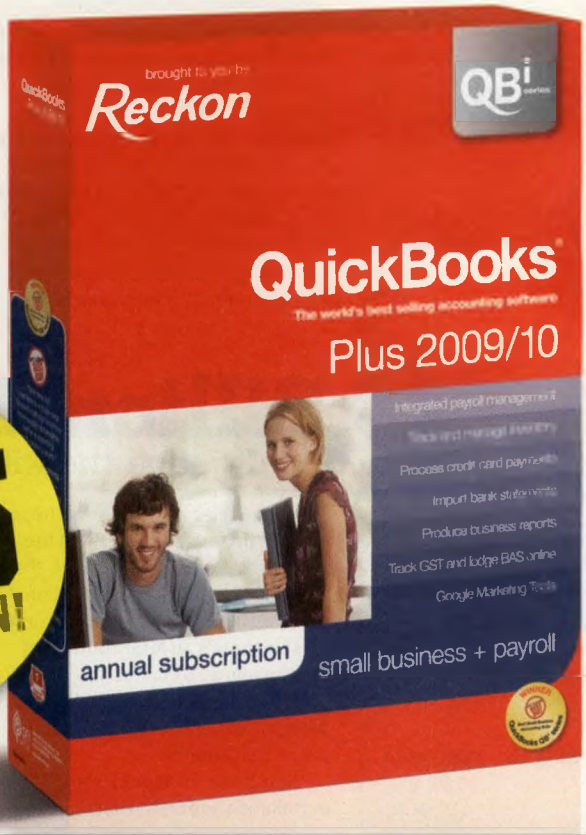

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M910APC

A great HD performer, just don't try to watch too many SD broadcasts on it.

8/10

Panasonic Viera TH-P50G10A

Great HD performance, but far from perfect.

Panasonic
www.panasonic.com.au
$3,299

Natural colours; reasonably priced; good performance.

Mediocre blacks.

SPECIAL FEATURES
Three HDMI connections
AVCHD playback off SD card
2,000,000:1 contrast ratio

APC MAGAZINE HIGHLY RECOMMENDED apc

Plasmas are traditionally power-hungry beasts but Panasonic's new NeoPDP technology has doubled luminescence while slashing power consumption. It still sucks down more juice than LCD equivalents, but NeoPDP, combined with other power-saving technologies, mean this is far greener than previous generations and that the panel won't expire from burn-in issues for 100,000 hours (up from 10,000).

The glossy black bezel looks good although the chunky base is unrefined. The remote looks clunky with its large lettering, but it's simple to find what you need and it's very responsive.

Plasmas should offer superb contrast but the G10 is hit and miss. Rather than being as black as the bezel, the screen (even when it's off) is slightly grey. It's not too distracting, but having 'true blacks' is one of the selling points of plasma. It is slightly annoying having noticeable letter box bars bordering movies when watching in a darkened room but, still, the contrast visible within the picture is very impressive and belies the 2,000,000:1 contrast ratio.

It was excellent at upscaling regular digital TV. There were hardly any jaggies surrounding objects (unless the broadcast quality was particularly poor), although occasionally they could look a little soft. We can't complain too much though, as stretching relatively low-res images across such a massive display is always tricky. HD TV looked great. Colours are all very natural, although they might seem subdued for some. A multitude of settings means everything is highly tweakable though.

Console gamers will like the fact that HD TV lag is virtually absent when in game mode: we didn't need to adjust anything in our Guitar Hero lag test.

The inbuilt speakers are some of the best we've heard: they're very loud with a huge punch. Audio is distinct and a 'virtual' surround sound effect works quite well.

Blu-ray movies looked superb, with good contrast and Panasonic's (Motion Flow-like) 600MHz sub-field technology happily smoothing out panning shots. Contrast and colours all looked realistic. Fortunately, it kept a sense of drama: some TVs have a habit of making movies and TV look so real that all sense of drama is lost. Here, we felt we were in a cinema and everything was lifelike without being too realistic.

Sport looked great in HD, but when upscaling poor-quality SD broadcasts on digital channels, One occasionally became an unwatchable blocky mess.

The HQV technical quality benchmarks highlighted a few issues. The Panasonic isn't the best at reducing image noise and it struggled displaying single-pixel lines (especially when moving and de-interlacing). However, this was rarely noticed in the real world, and its performance at removing jaggies around stationary and moving objects was one of the best we've seen.

Connectivity includes three HDMI ports and an optical S/PDIF out port. Features include an SD card reader that can playback photos and AVCHD video.

Provided you don't mind suffering bad image aberrations in poor-quality SD broadcasts, most people will like this TV and, at the price, it's good value. Sony's 52in Z-series Bravia is arguably a better buy in terms of quality, but it costs more. Elsewhere, LG's cheaper, similarly sized Time Machine offers inferior quality but superior features.

Nick Ross

8/10

LG Time Machine 50PS80ED

Why buy two devices when one will do?

LG
www.lge.com.au
$3,699

Very useful features; good value, good quality. ✔

Possible burn-in issues; poor blacks. ✖

SPECIAL FEATURES *i*

TV recording and timeshifting functionality
Ample connectivity
1080/24p playback

LG's new 50in plasma has a 250GB hard disk built in for timeshifting and onboard recording. It's being marketed heavily as the 'Time Machine' TV.

With a thick-glass front and weighing 38kg it's a massive imposing beast that will look good in any living room. Disturbingly, once we'd plugged it in, we were alarmed to see burnt-in images of the last broadcast it played. It happened frequently and we're not convinced burn-in won't be a problem.

The 250GB hard disk can record up to 23 hours of HD or 57 hours of SD TV. Twin tuners mean you can record one channel while watching another. Recordings can be scheduled using the built-in 7-day EPG.

You can add an external hard disk via the USB port to boost storage (the TV will format it so that it won't be readable by a PC). Usefully, however, it will play back media from regular USB storage devices and has easily the best codec support we've seen: great for ardent downloaders.

Under general use, image quality is good. Colours can occasionally be a bit subdued or in-your-face, but few would complain. We were disappointed with the black performance — letterbox bars in particular are distracting. But this is more of an issue in a darkened room.

Running our HQV technical quality benchmarks showed that noise reduction was good. Jaggies were minimal but the occasional bright fringe sometimes followed bright moving objects around the screen. It made a good stab at the technical de-interlacing tests but detail-rich panning shots weren't the smoothest, and there was some visible flickering.

Our Blu-ray movies looked impressive, with smooth motion at 1080/24p, good contrast range and natural colours. HD TV was impressive, if not quite the sharpest we've seen, and SD upscaled very well indeed, with minimal jaggies and aberrations.

Connectivity is with four DVI ports, and all that's missing is Ethernet. The speakers are part of the bezel and get loud and punchy.

LG's Time Shifting and media playback are two of the most useful features we've seen. The Panasonic G10 offers slightly better image quality, but, unless you already own a DVR, most would be better off with this. While we're not happy with the burn-in problems, the image quality and features, coupled with the relatively low price, can only mean it's a winner.

Nick Ross

APC MAGAZINE
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HIGHLY RECOMMENDED
First they put the tuner inside, now the LG Time Machine can also record your favourite shows.

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FreeNet Antennas

• Built-in electronics
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Just $668/pair

Dealer inquiries welcome

www.freenet-antennas.com/bridge

9/10

Ricoh CX1

This camera presses all the right buttons.

Ricoh Australia
www.ricoh.com.au
$599

9 megapixels; solid feel; great manual.

No SD card; stupid carry strap.

SPECIAL FEATURES
9 megapixel
7x optical zoom

This is a solid little camera seemingly hewn out of a solid block of metal. It is the standard "cigarette packet" size with a 3in LCD along with a vertical row of buttons for Menu, Function, Timer/Delete and Display. A small four way joystick sits above and to the right of these for Macro and Flash. One last button is for Play.

The top has a power button, large shutter release, wide/tele combo and a rotary dial for settings such as Easy Menu, multi-frame shoot, video and so on. You can also save custom shooting settings under My1 and My2 positions.

A ½.3in CMOS sensor allows shooting up to a tad over 9 megapixels and optical zoom is a respectable 7x. This makes the CX1 quite suitable for everday shooting, but would be struggling at taking meaningful shots of high speed sports say; not because of the lack of high shutter speeds, these go up to 2,000 of a second, but that simply 7x for motor sport, football etc is not enough.

While the CX1 has internal memory of 88MB, with 9MP capability, you'll want to grab a high speed SD card as this really is not enough. Personally, I think with the current prices not including an SD card in the box is a bit miserable.

Having said that, picture quality is good, functions and settings easy to manipulate and the CX1 is very solid to hold and keep stable, despite of its "compact" shape. Yes I am unashamedly a "standard" or "traditional" body shape to minimise camera shake. The built in anti shake system did work well though in my testing.

In all, this is a great little camera which executes the fundamentals brilliantly. One majorly annoying thing though; which genius engineer thought of the way the supplied camera strap is fitted? You'll be in a fit of rage after 10 minutes of trying to thread the string through the holes and like me, give up!

David Hague

A solid effort from Ricoh, the CX1 has all the features a compact needs.

8/10

Vivo 26in Full HD LCD TV

Full HD at an SD price.

Vivo International
www.vi-vo.com
$599

Full 1080p HD; digital and analogue tuners; great value.

Slightly noisy picture; inconsistent HDMI support.

SPECIAL FEATURES
Built in tuner
Wide range of inputs

When you're paying around 2/3 the price of an equivalent brand-name HDTV, you would expect some significant compromises, but, to our surprise, Vivo delivers a quality 1080p high-definition television at an "HD Ready" (720p) price point.

The first thing you will notice is that it looks stylish. There are adequate inputs including two HDMI 1.3 and composite video connectors, VGA for computer input, component video, S-Video and coax digital audio. The remote control fits nicely in the hand and has large enough well-spaced buttons, with good tactile feedback.

The Vivo has both a built-in Full HD digital tuner as well as an analogue tuner. In our tests they worked perfectly, finding all available digital and analogue channels.

We initially tested the set with the default setting and noticed there was some blocking on digital broadcasts, although this was fixed by turning the noise reduction function on. To test the panel quality we turned off all sharpening and noise reduction processing to view the test patterns from our Silicon Optix test disk. The picture was slightly noisy (although no worse than any other sub-$1,000 TV); however, it excelled in smoothing jaggies and displaying the complex high-definition patterns without banding or strobing.

There was some inconsistency with the HDMI inputs. Our Sony Blu-ray player supported all resolutions whereas our Panasonic Blu-ray recorder only saw the TV as capable of 1080p at 50 or 60fps.

What you miss out on (compared to our far more expensive Bravia reference television) is the really dark blacks, 200Hz picture and advanced image processing. However, when you consider the significant price difference, do you really need them?

David Neiger

The Vivo LCD offers impressive performance at a fraction of the Big Brand cost.

8/10

Yamaha YHT-992AU

Big, brash and impressive.

Yamaha Music
www.yamahamusic.com.au
$3,499

Numerous AV inputs; upscaling; well-balanced solid sound.

No support for streaming media; digital (DAB+) or internet radio.

SPECIAL FEATURES
DTS and Dolby Digital
90W per channel
Eight-speaker setup

The Yamaha YHT-992AU 7.1 channel home theatre system is an excellent way of filling a medium-to-large sized room with high-quality sound. The system comprises the RX-V665 surround sound receiver, EF series speakers and ST-RSW300 subwoofer.

The speakers are slim with a gloss-black finish. The front speakers are tall (980mm) and house two 160mm woofers, a 130mm mid-range (with wave guide) and 25m dome tweeter (also with wave guide). At around 19kg each, they are heavy but don't dominate the room. The centre speaker incorporates two 130mm "woofers" and 25mm wave guide tweeter in a 190mm tall enclosure, which can be a little tall to fit in some shelving units. The satellite speakers have a single 130mm woofer and 25mm wave guide tweeter, and at only 320mm tall can be placed discretely around the room.

The YST-RWS300 subwoofer is a cube that houses a 250mm long stroke cone driver to provide a decent bass response that complements the bass response of the front speakers.

The heart of the system is the RX-V665 receiver, which supports two sets of speakers, being the main 7.1 channel system and a secondary stereo zone. Just about every input you require is provided including analogue stereo, coax and optical digital inputs, an equalised phono input and multi-channel analogue audio input for SACD or DVD audio players. The unit also has four HDMI inputs, with 1080p upscaling as well as a connector for an optional proprietary iPod dock. The unit can be integrated with home automation systems using the remote in and out terminals and can be controlled from the front panel or via the supplied infra-red remote control.

At a rated output of 90W per channel, the receiver provides more than enough power to fill even large rooms with sound, although there are pre-amp outputs to allow you to connect additional amplifiers.

Setting up the system is relatively straightforward, although no speaker or subwoofer cables are provided. The unit features YPAO (Yamaha Parametric Acoustic Optimiser), which makes balancing and calibrating the system a breeze. Simply plug in the supplied microphone, connect the monitor cable (RCA video) from the receiver to the TV and follow the on-screen instructions. A few test tones later, everything is ready to go.

The system provides several acoustic effects which are optimised for different types of movies, music and games. You can also simulate different concert hall acoustics as well as access surround decoders to create multichannel audio from stereo sources. It also includes decoders for DTS (including Master Audio) and Dolby Digital (Plus and True HD) to allow you to enjoy multichannel audio via bitstream if your Blu-ray player doesn't support the high-resolution audio codecs. Personally we found the acoustic effects gimmicky, although the enhancers noticeably improve the audio from compressed music sources such as MP3 files and iPods.

We tested the system using straight audio mode with a variety of genres of music. Sound quality from the Dolby Digital Plus test disc was excellent, with a well-balanced sound and wide, clear sound field. To our ears the sound was mellow but ever so slightly lacking in crispness. Bass was clear without being over-emphasised and the mid-range response was excellent, which makes this system ideal for movies and dialogue as well as vocals and jazz.

Our only criticisms were that it needs to move with the times and offer support for streaming audio (there is no Ethernet port) and DAB+ digital radio as well as include an iPod dock. That being said, most people who would purchase this system would be more interested in high-quality audio and won't miss streaming or compressed audio and are more likely to use a high-end CD or Blu-ray player rather than an iPod.

David Neiger

No streaming or iPod options, but then again, if you buy this you're into quality sound anyway.

8/10

Canon EOS 500D

15 megapixels and HD video capability? Yes, please!

Canon
www.canon.com.au
$1,499

✔ Great LCD screen; good images; good low-light focusing.

✖ HD video could be a bit better: body still a bit too plasticky.

SPECIAL FEATURES
- 15.1 megapixels
- HD video
- Simple creative auto mode

APC MAGAZINE HIGHLY RECOMMENDED

The latest and greatest in Canon's ongoing entry-level line of DSLRs (that started with the 400D and the 450D) has added the ability to shoot HD video. All you have to do is go to Movie Mode and hit the record button for 1080p movie making right in your entry-level DSLR.

Looking essentially identical to its predecessors, the 500D has the external benefit of a nice new 3in LCD screen that makes shooting and displaying images that little bit more comfortable. Since the body is almost identical to that of the 450D, the shooting experience is — unsurprisingly — similar.

A new feature that has been added from the 500D's more expensive relatives is the 'creative auto' mode, which is a semi-manual mode that replaces shutter and aperture adjustment options with two sliding scales. Exposure is simplified into brighter/darker adjustments while background controls image blur and sharpness. This is a more beginner-friendly way of adjusting the shutter speed and aperture.

The 500D offers some pretty decent specs, including a 15-megapixel APS-C size CMOS sensor and the same 9-point user-selectable autofocus system that made the 450D so appealing.

One drawback is the lack of in-body image stabilisation that relies on the lens handling the problem of camera shake. It's not a problem on its own but it does make new lenses more expensive.

Good low-light focusing and the inclusion of HD video makes this a good camera for any new users.

Christopher Zammit

7/10

Canon PowerShot SX200 IS

Massive zoom, wide angle lens and HD movies on a budget.

Canon
www.canon.com.au
$325

✔ Compact; 12x zoom; good-quality pics and video.

✖ Flash can make holding the camera awkward.

SPECIAL FEATURES
- 12x optical zoom
- HD movies
- Manual as well as auto
- Image stabilisation

A massive 12x zoom paired with a wide-angle lens makes the SX200 stand out from other similarly priced compact cameras on the market. When you match that with superbly sharp HD video, you get an all-purpose image-capturing device that meets all your needs in one tidy, compact unit.

Full manual control over shutter speed, aperture and focus, in addition to a glut of other shooting controls, allows for more freedom than you would otherwise expect. The SX200 has two Auto modes for the beginner: Smart Auto picks from 18 pre-defined settings depending on what's in the frame; and Easy mode, which is pretty much your pure point-and-shoot full auto. If you're a bit more of a hands-on user there are also Program, Aperture priority, Shutter priority, and Manual modes, which allow more adjustable controls over exposures.

A macro function also allows sharp photographs to be taken at ranges where the lens is almost in contact with the subject. We had a lot of fun photographing fine details of anything and everything around the office.

The SX200's autofocus is highly accurate, though, like most compacts, it did occasionaly get confused. Image quality is fine but images can suffer from soft edges in low lighting.

The SX200 is a decent camera with great functions and usability. Image quality is good (but not great), but HD video and the massive zoom more than make up for it.

Christopher Zammit

7/10

Windows Mobile 6.5

We got hands on with a preview of WM 6.5 Professional.

Microsoft
www.microsoft.com/windowsmobile
Preview

✔ Attractive homescreen and start menu; enhanced touch controls; updated browser.

✖ Still not completely touch-friendly; multimedia functions not updated.

SPECIAL FEATURES
Homescreen overhaul
Desktop-based Start removed

Windows Mobile phones have some of the flashiest user interfaces around, but the vanilla version of Windows Mobile 6.1 Pro is a different story. It's painfully plain, and once you strip off all the handset-specific eye candy, it's no surprise that vendors like HTC have all but replaced the Windows Mobile front-end with its own graphics.

With the introduction of Windows Mobile 6.5, however, this is set to change. One of the main improvements is a user interface overhaul for both the homescreen and the start menu. Smartphones running WM 6.5 are yet to be released, but we were able to get our hands on an unofficial ROM for the Sony Ericsson XPERIA X1.

It's had a bit of spit and polish, but it still doesn't shine just yet.

The new homescreen is markedly different from the old one, with traces of the Zune evident in the large lettering for the different panels. Microsoft has finally optimised it for touch use, and you can drag your finger up or down the screen to move through the different panels, some of which also let you swipe across to navigate through content like photos and email accounts.

The clunky drop-down Start menu, a relic from the old Pocket PC days when Microsoft thought replicating desktop elements on a mobile device would make it more intuitive, has finally, blessedly, been abolished. The Windows flag is still there, but tapping on it now brings up a launcher screen for accessing programs and settings, with the same image from the homescreen displayed as the background.

From a UI perspective, it's mainly the homescreen and Start menus that have changed. There are other small enhancements designed to make Windows Mobile more touch-friendly, like a slider unlock screen, larger pop-up menus, a slider for answering incoming calls, and a 'bounce' when you've scrolled to the top or bottom of a screen. It's still not completely touch-friendly though: the close button in the corner is as tiny as it ever was, and accessing controls in the taskbar like volume and data connection still require a stylus or fingernail tip.

Internet Explorer Mobile is the only program that's been updated in 6.5. It uses the same rendering engine as IE 6, which, while five years old, is still a marked improvement over the previous IE Mobile browser. Microsoft has taken a leaf from the Opera Mobile playbook by hiding all of the controls to maximise browsing space. It also supports Flash and AJAX, but we're going to reserve judgment until we see it on a phone that's optimised for WM 6.5. IE Mobile 6 struggled with complex web sites on the X1, and while it was able to play YouTube, the video was choppy and lagged behind the audio.

Unfortunately, the Zune influence hasn't carried through to Windows Mobile's multimedia capabilities. It's still using the same Windows Media Player 10 for music and video playback, which rates as one of the worst mobile multimedia programs.

Windows Mobile Marketplace, Microsoft's version of the app store, is due to launch alongside Windows Mobile 6.5. The My Phone online service is also meant to be built into WM 6.5, which is a free service that backs up your contacts, calendar, tasks, text messages, multimedia and docs to the My Phone portal for free.

The improvements in WM 6.5 are welcome, but they're not terribly exciting compared to what HTC has been able to accomplish with its WM 6.1 mods. If Microsoft was able to license the Touch FLO 3D interface for Windows Mobile 7, however, then it would really be in business.

Jenneth Orantia

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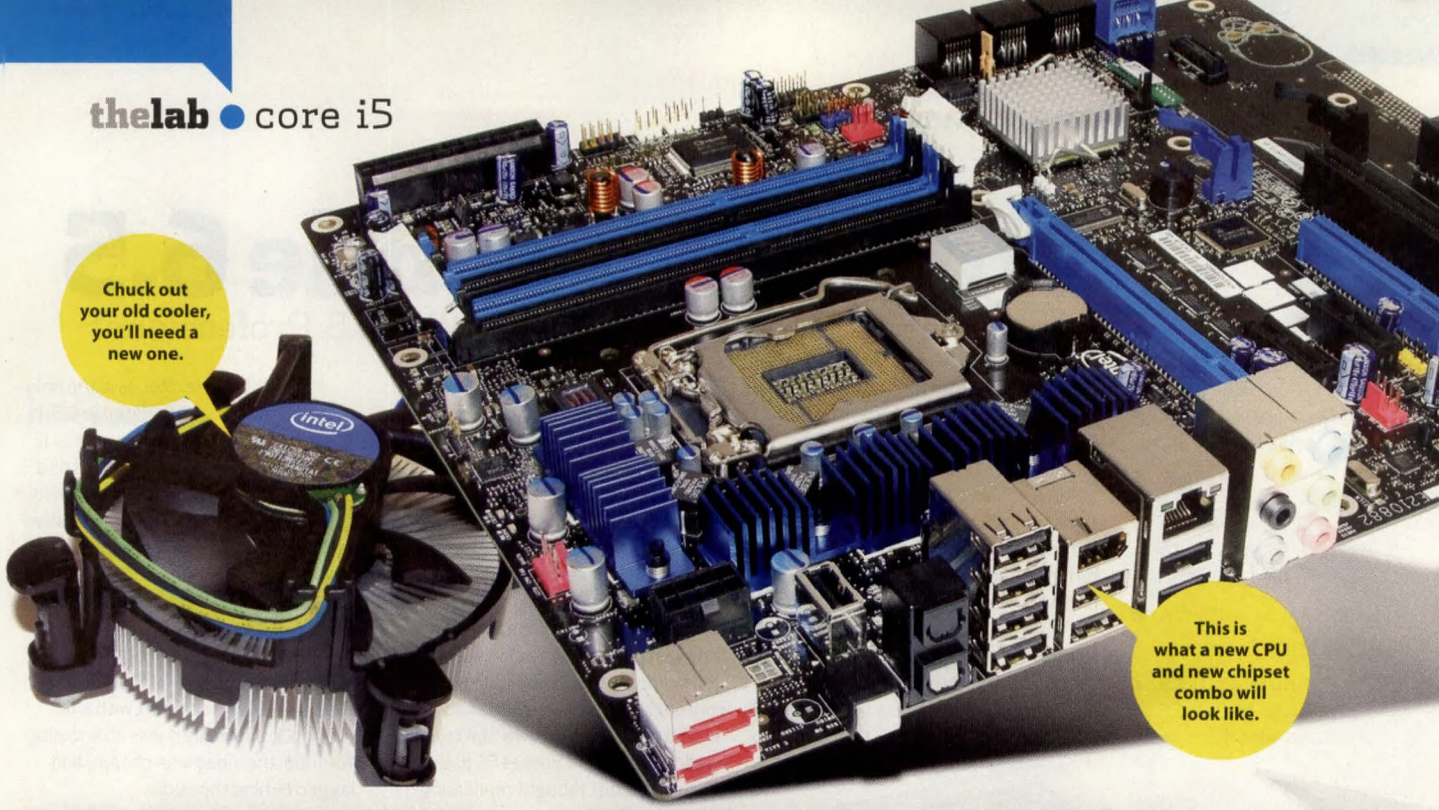


INTEL CORE I5: YOUR NEXT CPU

Intel's new Core i5 processor is destined to replace the Core 2 Duo chips that power many of today's PCs. **Nick Race** cracks it open in the Labs.

Core i5 makes Intel's top-of-the-line design introduced in the Core i7 processors finally affordable and will replace Core 2 Duo as the mainstream processor of choice. The Core i5 will bring quad-core processing, turbo boost and Intel's Nehalem architecture to the average desktop, resulting in much better performance *and* lower power consumption. Without the price premium of the Core i7 chips, the Core i5 (which will cost around $290) is truly the new-generation processor for the rest of us.

Intel first introduced the Nehalem architecture (a fundamental change in the way Intel processors were designed) with the Core i7 900 series. This was a huge hit, a top processor design with blazing speeds and great support from motherboard vendors on a solid platform. The problem was the price tag. As enthusiast parts, the Core i7s attracted the kind of enthusiasts' high-end pricing so well known in this industry. More than $1,000 for a CPU? No thanks.

Normally, these high-end first flush chips would tend to be replaced by even faster ones, the old models becoming the mainstream with a plunge in price. Not this time. Intel's three new mainstream processors released this month have changed the rules. The Core i5-750 and two new Core i7s, the 860 and 870, are a new design released to fill the gap between super speedy and super expensive Core i7-900 series and the now old and busted Core 2 Duo and Core 2 Quads.

If you're confused by the fact that some of the new chips are labelled Core i7, that's understandable. Intel's naming convention is puzzling, delivering a side serving of confusion with the new processors, at least in the short term. The new hierarchy of Intel chips will go like this: at the top end are the older Core i7-900 series processors, which are compatible with X58 motherboards. Under these are the new Core i7-800 series processors, which at launch go with P55 motherboards and more chipsets yet to be announced. Next are the Core i5-700 series chips, which also work with P55. They are all available now.

To be clear, Core i7-900 series and the Core i7-800 series processors aren't interchangeable. There's no upgrade path from one to the other, since they use different sockets and operate very differently.

Unfortunately, Intel has dodged an excellent opportunity to simplify their processor naming with this malarkey. So if you're speccing up a new system, remember that not all Core i7s are created equal — and make sure you match the chip with the right chipset and motherboard, or you'll be seeking a refund one way or another.

PLUGGED IN

All three processors (Core i5-750, Core i7-860 and 870) have one fundamental difference to the older Core i7-900 series chips. Whereas the Core i7-900 processors used the new Intel QuickPath Interconnect to join the processor with the X58 chipset, the new Core i5 and Core i7-800 processors use the old tried and true Direct Media Interface (DMI), which has traditionally joined the northbridge and southbridge chipset elements together. This is because in the new design there is no northbridge. Core i5 and the new Core i7s perform the traditional tasks of the northbridge (the memory controller and PCI Express connections) in the processor itself. The P55 chipset picks up the rest of the

duties, looking after the storage subsystem, such as SATA and low-speed interfaces.

This is the most fundamental change in Intel's system design in a long, long time. Instead of a three-chip solution (processor, northbridge and southbridge), we're down to two, just the processor and southbridge. The new processors are getting closer to finishing the job that the Core i7-900 started with the integrated memory controller — and which should finally end up down the track with a system-on-a-chip design.

What remains the same between the two product families is that the new Core i5 and Core i7 processors also include the memory controller in the CPU itself, dramatically reducing traffic between the CPU and chipset.

These new chips buck the trend of how prices traditionally drop for CPUs. Intel has designed them as lower-priced CPUs, rather than just letting the prices drop over time. As a two-chip solution, and with the corresponding *huge* reduction in complexity required for the accompanying motherboards, they can't help but be cheaper. We like this a lot.

MOTHERBOARD CHIPSET

The P55 is the chipset that supports the new Core i5 and Core i7-800 processors. Previously codenamed Ibex Peak, it's the first of a range of chipsets that will work with these processors. It's also the first chipset to break the naming convention of Intel southbridges in a while. Older southbridges are named like the ICH7, ICH9 and ICH10 (which is found on X58 motherboards). The Ibex Peak is dubbed the PCH or *Platform Controller Hub*.

Considering that the CPU is now looking after the high-speed graphics and memory controller, what's left for the PCH? Well the P55/Ibex Peak/PCH is responsible for six SATA 2 ports, with Intel Matrix Storage RAID 0/1/5/10, the Intel HD Audio and a PCI Express x1 connection for peripherals and add-ons.

LOSING MEMORY

Another major point of difference between the older Core i7-900 and new Core i5 and Core i7-800 processors is a change back from triple-channel to dual-channel memory. The new processors use low voltage DDR3 with support up to 1,333MHz, while the i7-900 series, which only uses triple-channel, is limited to 1,066MHz without overclocks. Both generations use a memory controller integrated into the CPU. The dual-channel memory architecture for the new mainstream processors is not to be confused with DDR2, which is an older memory not used by these chips. For the Core i5 and Core i7-800 series processors you need to purchase DDR3 memory modules

SPEEDS AND FEEDS

THESE CHIPS DON'T JUST RUN AT ONE SPEED ALL THE TIME.

Measuring the performance of these CPUs is no longer straightforward, because a gigahertz measurement doesn't tell the whole story. As with the original Core i7 processors, the Core i5 and new Core i7-800s use the Turbo Boost feature of the Nehalem micro architecture. This increases the clock speeds of a number of cores in the processor depending on how many cores are under load and how hot the chip is. It means the cores will end up running at different speeds depending on the number under load.

A perfect example is the single-threaded software application. We'll use the Core i5 as an example here. The Core i5 750 is rated to run normally at its stock speed of 2.66GHz. But if we throw a single-threaded application at it, three of its four cores will sit idle while the last gets a big speed boost up to 3.2GHz to deal with the single-threaded app. Different numbers of busy cores end up with different speed boosts.

Turbo Boost is an independent process, and the speeds of the cores jump up and down as the load changes, so if you monitor it, don't expect to see any particular speed in the processor's range as normal. What is set in stone is the amount of cores and technologies enabled on each model. As the entry-level mainstream processor, the Core i5-750 uses 4 physical cores and does not include Hyper-Threading, leaving us with a total of 4 cores/threads. The Core i7-860 and 870 both have four physical cores plus Hyper-Threading, presenting 8 cores/threads to the operating system. All the processors stock a respectable 8MB of L3 cache.

CPU	Core i5-750				Core i7-860				Core i7-870				Core i7-950			
Stock speed	2.66GHz				2.8GHz				2.93GHz				3.06GHz			
Physical cores	4				4				4				4			
Busy cores	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1
Bin jumps	1	1	4	4	1	1	4	5	2	2	4	5	1	1	1	2
Actual speeds in GHz	2.8	2.8	3.2	3.2	2.93	2.93	3.33	3.46	3.2	3.2	3.46	3.6	3.2	3.2	3.2	3.33

Reading this table: Busy cores are shown with the numbers of cores under load, the "bin" or speed increment and the real value in GHz. For example, the Core i7-870 with 3 cores under load can jump 2 speed bins to 3.2GHz.

in pairs rather than triples, though some motherboards tested here include 6 memory slots for larger overall memory capacity.

PUTTING IT ALL TOGETHER

So what do you need to put together your own PC using one of the Core i5-750, Core i7-860 or Core i7-870 models?

The CPUs themselves are available in the retail channel already. Next you need to pair them with a P55-based motherboard. The major motherboard vendors already have a line-up of different P55 boards ranging from high-end models like the Gigabyte GA-P55-UD6, ASUS P7P55D Deluxe and MSI P55-GD80, which are aimed at gamers and overclockers, to more mid-range and budget solutions like the Gigabyte GA-P55-UD3 and MSI P55-GD65.

Next you need two or four sticks of DDR3 memory capable of 1,333MHz or greater (also known as DDR3-10600). As the new processors are dual-channel, a multiple of two modules is required instead of multiples of three as for the older Core i7-900 series.

Last, but not least, you'll need a Socket LGA-1156 compatible cooler. Our testing was performed using the Cooler Master Hyper TX3. Also expected to be available is the Cooler Master Hyper 212 Plus and adaptor plates for high-end CM Coolers, the V8 and V10. Thermaltake's SPiN high-end air cooler will be available shortly after launch, while Thermalright's MUX-120 is still up in the air. Intel-boxed processors will of course come with a "stock" compatible cooler, but you'll want to upgrade it if you feel like doing some overclocking.

You'll also need the usual array of components to complete the system: a graphics card, chassis, PSU, optical and hard disk drives. (See Master Builder on page 62, for Enspire's first build of a Core i5 PC).

ON THE TEST BENCH

APC worked hard to get our hands on all three new processors: the Core i5-750, Core i7-860 and 870 models. We ran all three chips through our standard CPU testing, plus a few more real-world benchmarks to get a good feel for where these guys sit on the grid. To test these new processors, we needed a new *APC* test bench.

We used the following equipment:

- Gigabyte GA-P55-UD6 mainboard
- 4GB A-Data DDR3 2200 memory
- Gigabyte Odin Plus 700W PSU
- Zotac NVIDIA 9800GTX+ graphics card
- Intel XM-25 32GB SLC solid state hard disk drive
- Cooler Master Hyper TX3 heatsink and fan

Each CPU was dropped in and, apart from a BIOS refresh and OS reboot, the software platform was identical. For this round of testing, we used Windows 7 Ultimate RTM 64-bit fully patched. System Restore was switched off and disk indexing was kept on. Please note that the scores seem a little inflated over our usual benchmark results. This is mostly due to the extremely fast Intel SSD, so keep that in mind when comparing these results to those previously published.

We tested all the CPUs with the following benchmarks:

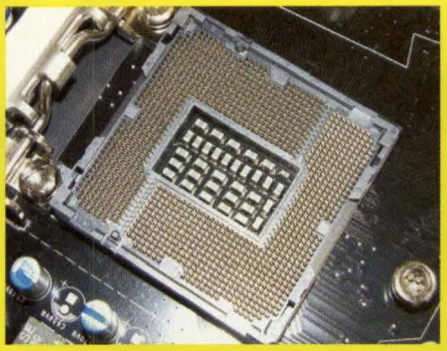
- PCMark Vantage Professional — with default settings
- WinRAR 3.9 x64 — benchmark tool
- DivX 7 — encode MPEG-2 to DivX using "Home Theatre" profile
- MainConcept Reference — encoding 43.34-minute-long 1,280 x 720 MPEG-2 to H.264 AVC 720p
- SiSoft Sandra — processor arithmetic benchmark and multimedia benchmark
- Cinebench R10 x64 — graphics rendering single and multi CPU
- Left 4 Dead — custom recorded time demo file, low graphics settings

All of the benchmark applications except Left 4 Dead are available for you to download and run, though some are time-locked demo versions and may require purchase and registration. They will give you a sense of how your PC stacks up against a state-of-the-art machine running the new Intel processors and a solid state disk.

RESULTS

First cab off the rank was the Core i5-750. Though it's the baby of the new series, it still packs some serious punch. PCMark Vantage clocked it at a baseline of 13,928, actually faster than the results posted by the Core i7-900 series-based systems reviewed elsewhere in this issue. Not bad for an entry-level part!

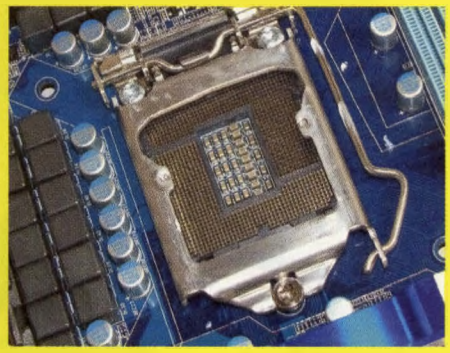
The Core i7-860 was a big bump, both in name and performance from the Core i5-750. Running at a base speed of 2.8GHz and capable of Turbo Boost jumps up to 3.46GHz (a speed increase of 23%), it



SLOTS AND SOCKETS

The big physical change and one that will undoubtedly lead to confusion is the adoption of a new socket for the Core i5 and Core i7-800 series processors. Known as LGA-1156, it's a Land Grid Array socket with 1,156 points of connection. Size-wise, it's roughly between the LGA-775 of the Core 2 platform and the 1,366 of the Core i7-900 platform. Accordingly, coolers for either of those platforms won't work with the new motherboards.

Something else to keep in mind is that the PCI Express lanes provided for graphics cards on the new platform both run at x8 when using two cards (as opposed to the x16 standard speeds for graphics slots on high-end and performance platforms). When you're using a single card setup, it runs at full x16 speed. Interestingly, both AMD ATI CrossFire and Nvidia SLI have been certified for the platform, so if you feel the need for a dual graphics card setup, then just ensure the board has two full length slots and you're good to go.



smashed through PCMark Vantage with a score of 15,164, while the 870 part earned 15,630.

Our video encoding tests saw a slight jump as well; the DivX encoding finished up in 408 seconds, while the H.264 encoding through MainConcept Reference only took 33 minutes and 45 seconds, shaving almost 4 minutes off the Core i5's time.

SANDRA

The Sandra processor arithmetic and logic benchmark put a total of 65.6GOPs on the Core i7 860, a decent jump over the 52GOPs of the slower Core i5 processor, mostly thanks to Hyper-Threading being enabled on the higher-end part. The Sandra multimedia test clocked in at 134.67MPixels/s, which is one of the biggest leaps over the Core i5's score of 106.44MPixels/s. The Core i7-870 also posted a big jump again clocking in at 147MPixels/s.

It was also interesting to see just how clearly staggered the performance results of these new chips are. Even though there's some variability built in with the changing Turbo Boost speeds, each model shows a clear performance difference to the next.

The gaming benchmark with Left 4 Dead saw the Core i7-860 chew through the time demo at 136fps using lower graphics settings, which was only slightly faster than the i5's 134fps. It's not a huge difference in speed, considering the bottleneck of the graphics card and variability of the benchmark results with game testing.

We also ran an older Core 2 Duo processor (the E7200 model, running at 2.53GHz) through the same battery of tests, using as close a hardware configuration as possible. As you can see from the benchmark results over the page, there's a significant performance jump between the generations!

OVERCLOCKING

Out of curiosity we overclocked some of these new processors to see just how quick we could make them with a minimum of effort. Slotting in the Core i7- 870 and using some of the tools provided with the Gigabyte GA-P55-UD6 motherboard (beyond the quite reasonable recommended settings) we upped the processor up to 3.7GHz and the RAM up to 1,930MHz. At this speed the system was completely stable, and a quick run through PCMark Vantage clocked it at 17,511. Not bad for 15 minutes work!

GRAPHICS CARDS IN MY CPU?

It's not quite the case yet, but Intel is moving toward putting the graphics processing inside the CPU. The beginning of this process is already happening, with Core i5/i7-800 including the PCI Express connection in the CPU, rather than leaving it to a northbridge. Pencilled in for the next generation of Intel mainstream processors for desktop and mobile (codenamed Clarkdale and Arrandale), the GPU will be included inside the CPU along with the memory controller. In the short term, this will only be a mobile and mainstream solution, as limited space sees the core count of

Zotac's 9800GTX is a high-end mainstream graphics card.
CoolerMaster's Hyper TX3 was used to cool our test rig.
Low voltage DDR3 2200+ memory from Adata.
A high speed Intel solid state drive is still the fastest around.
ZOTAC
GeForce 9800GTX+
A-DATA

the processor drop down to two. No room for quad-core and graphics in the one chip yet.

SO IS ALL THE FUSS JUSTIFIED?

The Core i5 and Core i7-800 series processors are among the few bits of kit that have gotten us really excited in the Labs in recent years. Sure, it's great to get our hands on the newest ultra-high-end components, but it's more satisfying to test what's likely to end up in most people's systems in the coming year. We've given Nehalem (both in servers and Core i7) many thumbs up over the past few months, with good reason. Now we finally have the affordable versions destined for ordinary PCs, and they certainly live up to our expectations. Our benchmark results show that the i7-860 and i7-870 are capable of outperforming some Core i7-900 series chips, with a lower price tag to boot. The simplification of the motherboards and the move away from a three-chip package to a two-chip package is going to mean lower costs without a drop in performance. The Core i5 and Core i7-800 have excellent performance characteristics, cooler operating temperatures, lower power consumption and a lower price tag. What more could you want?

So where does the Core i7-900 line fit in? Realistically, moving to a Core i7-900 high-end system won't gain you a huge performance increase, unless you are overclocking, but will add significantly to the price tag. The Core i5 and new Core i7-800 series are the new mainstream processor for the rest of us.

BENCHMARKS COMPARED

CPU	Intel Core i5-750	Intel Core i7-860	Intel Core i7-870	Core 2 Duo E7200
PCMark Vantage	13,928	15,164	15,630	7,613
DivX encoding	431 seconds	408 seconds	355 seconds	751 seconds
H.264 720p encoding	37 mins, 37 secs	33 mins, 45 secs	30 mins, 53 secs	1 hour, 36 mins, 31 secs
SISoft Sandra arithmetic	52GOPs	65.6GOPs	71.5GOPs	20.18GOPs
SISoft Sandra multimedia	106.44MPixels/s	134.67MPixels/s	147MPixels/s	48.66MPixels/s
iTunes – WAV to AAC	1 min, 40 secs	1 min, 36 secs	1 min, 30 secs	2 mins, 11 secs
WinRAR benchmark	3,017KB/s	3,079KB/s	3,251KB/s	2,174KB/s
Cinebench R10 single/multi CPU	4,432/14,619	4,750/17,666	4,948/19,048	3,058/5800
Left 4 Dead	134fps	136fps	138fps	DNF

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MT AF Multi-Target AF

AUTO Multi-pattern Auto White Balance

Vibration Correction

120 FPS

Electronic Level Function

1cm Macro

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SD HC

Motion picture with sound

USB

PictBridge

i5 MOTHERBOARDS

MSI P55-GD65

@ www.msicomputer.com.au

✔ DrMOS; active phase switching and OC Genie work a treat; connectivity.

✖ Lacks a convenient CMOS reset for the fiddlers.

MSI's offerings for the P55 and Core i5 launch cover the entire range of needs, from those of gaming enthusiasts to those of budget-conscious consumers. The P55-GD65 falls somewhere in the middle, but it doesn't skimp on features.

Using the P55 chip combined with the new in-chip capabilities of the Core i5 and Core i7-800 series processors, the board is slim and cleanly laid out. Without the need for extra-huge heatsinks, the bulk of the board comes from cooling the power around the CPU socket.

MSI's DrMos makes a reappearance for high-speed MOSFET switching, which equals "cleaner" and more consistent power to the CPU, even under changing workloads. The biggie is the OC Genie technology, which is a hardware-based automatic overclocking solution. OC Genie is a poster child for set-and-forget-overclocking. Our tests achieved a 10% overclock on a Core i7-870, which is nothing to sneeze at for pressing a button, but, of course, your mileage may vary.

Similar to other vendor's offerings, the board includes active phase switching, which turns off power phases to the board when they are not required. It can save you some money over time. This version is OS-independent, done at BIOS level and doesn't require extra software to work. On this board, the switching is done over 6 power phases.

On the bench the P55-GD65 performed just as expected, with results falling within our 3% margin of error of the CPU benchmarks. With support for 7 SATA ports, plus a new nifty SATA/USB port, 7 USB ports, IDE, 7.1 audio digital and optical SPDIF, dual Gigabit Ethernet and a pair of PS/2 ports, there's all the connectivity you might need. For expansion and graphics cards, there's two 8x PCI Express, two 1x and one 2x. Two PCI slots finish the job. All in all, the P55-GD65 is an excellent choice for a Core i5 or Core i7-800 system, especially if you're a set-it-and-forget-it type with high-performance expectations.

ASUS P7P55D Deluxe

@ www.asus.com.au

✔ TurboV; memory checker; Drive Xpert hardware RAID; nice design.

✖ No eSATA on the backplate; TurboV remote control.

ASUS keeps a special brand for its ultra high-end boards. The "ROG" series (which stands for Republic of Gamers) is the top of the pops for ASUS models. Although jammed with features, the P7P55D Deluxe board doesn't earn that moniker, but our tests show it can stand pretty tall in its own right.

The board includes the TurboV functionality, the overclocking assistance tool we've seen on some high-end ASUS boards since late 2008. This time around, the board ships with a TurboV remote control, just in case you wanted to overclock (or underclock) your PC while you're not at the keyboard! With our feet back on the ground, functionality like TurboV does make overclocking easier. Also on the board is ASUS Drive Xpert, a hardware RAID controller independent of BIOS and OS for backup or fast striped drive arrays.

ASUS has shifted to a "16 x 3" phase power design for this board. It assigns 16 power phases to the CPU for finer power control, and then provides the additional 3 phases for the processor's "uncore" (the cache and whatnot outside the CPU core). It's all in the name of stable overclocking.

Connectivity includes nine internal SATA ports, and no external eSATA ports plus an IDE port inside. There's eight external USB, one Firewire, 7.1 audio, digital and optical SPDIF and PS/2 ports. Two Gigabit Ethernet ports and a BIOS reset switch round out the backplate.

The board is nicely laid out, and the P55 cooler is really quite attractive. A mirror-like finish and logo on top of the passive cooler say understatement, rather than LOOK AT ME! We like it a lot.

Performance is on par with the CPU results above at normal settings. Once TurboV was switched on and some minor overclocking done in Automatic mode, we eked out an 8% overclock without breaking a sweat. Not bad for no work at all.

HIGHLY RECOMMENDED- LITTLE SEPARATES THESE BRAND NEW P55 MOTHERBOARDS THAT WILL RUN THE NEW CORE i5 AND CORE i7 PROCESSORS.

- BUILT-IN BLUETOOTH
- ESATA PORTS FOR EXTERNAL HARD DRIVES
- UPDATED INTERNAL CONNECTIONS

Intel DP55KG Extreme

@ www.intel.com.au

✔ 8 SATA ports; good layout and design; eSATA ports; Bluetooth.

✖ No IDE for those that need it.

Intel mainboards have a reputation of being stable, reliable and boring. That looks set to change with the DP55KG, which is very attractive in its own right. Though it still lacks many of the frills seen on the other boards here, such as fancy heatsinks and one-touch overclocking, it's a competent board with all the right features.

The DP55KG Extreme Series board includes the usual complement of 8 external USB ports, FireWire and Gigabit Ethernet, and it also throws in two eSATA ports for external drive connections. The other immediately noticeable change is the removal of the IDE port (which is almost exclusively used for optical drives these days). There's a full-length x16 PCI Express slot for graphics, plus a half-length x8 port for a second graphics card in SLI or CrossFire. An x4 port and two x1s make up the PCI Express complement. There are also two PCI slots, but one would be obstructed in an SLI configuration.

There's 8 SATA ports making up for the lack of IDE, and the power and cooling around the CPU socket are well set back, meaning oversized CPU coolers shouldn't be an issue. Interestingly, PCI Express power for the board uses a SATA power connector rather than the old Molex, which may make it difficult for those running systems with several hard disk drives. An internal USB port, good for Windows ReadyBoost, is included.

7.1 audio with optical outputs is included (and an optical input too), while Intel have seen fit to build in a Bluetooth module as well. Aesthetically it's a good-looking board: well laid out with a cheeky skull embedded with LEDs etched into the PCB.

On the bench, the board performs exactly as expected, with results coming in within our margin of error for benchmarks.

While the Intel DP55KG Extreme doesn't include many of the bells and whistles of the other boards tested here, it runs like a no-nonsense tool rather than a gaudily painted toy.

- ONE-TOUCH OVERCLOCKING
- DUALBIOS AND BUILT-IN SOFTWARE
- 24 POWER PHASES

Gigabyte GA-P55-UD6

@ www.gigabyte.com.au

✔ Smart6; combo eSATA/USB port; good performance; extra RAM capacity.

✖ Tightly packed board; Smart6 software still needs some polishing.

The GA-P55-UD6 from Gigabyte is the top-of-the-range board for the P55 in Gigabyte's range. What separates it from the next one down, the GA-P55-UD5, is the implementation of 24 power phases in the board. At a practical level, it increases the reliability of the power supply to the CPU and allows for finer-grained power management (for power savings etc).

The UD6 includes six DDR3 memory slots. Though the memory still runs dual-channel, the two extra slots are there if you feel you need to expand the memory capacity even further. There's 12 SATA 2 ports and a PATA/IDE port, three full-length x16 slots running at x16, x8 and x4 each, and two Gigabit Ethernet ports, which allow for failover and teaming.

The board is built using Gigabyte's 2oz. copper power layers and solid capacitors, and also packs in the usual Dynamic Energy Saver and DualBIOS. The UD6 model also includes a TPM, and some rather nifty software tricks to go with it. With a Bluetooth adaptor installed, you can set the PC to lock when you move away from it with your mobile phone. Gigabyte has gone above and beyond with its software offerings, including a set of six small utilities to make life a bit easier. There's a password storage app (which stores your passwords on the BIOS, theoretically invisible to security intrusion), a quick boot feature that works a charm, a system monitor for files and some parental controls right in the motherboard.

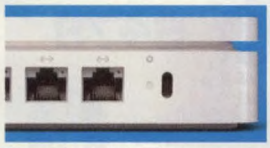
Under testing, the UD6 provided our base results (at stock settings of course) for the CPU testing. Performance was excellent and stability just fine. Some basic overclocking saw us using the Gigabyte QuickBoost for a one-touch OC, and it happily settled our Core i7-870 at 3.5GHz without a bother.

The board really packs a lot of features in a small space and will surely keep the overclockers and chronic fiddlers happy for some time to come. Will you need all this functionality though?

DUAL-BAND 802.11N WI-FI

Stephen Withers checks out the new kids on the Wi-Fi block.

UNDER REVIEW


Apple AirPort Extreme

D-Link Xtreme N Duo DIR-855

HP ProCurve MSM422 Access Point

Linksys N Ultra RangePlus WRT610N

Netgear RangeMaxWNDR3300

One of the big advantages of using a dual-band router is that the normal 2.4GHz band may be crowded in your neighbourhood, especially if it is a medium or high-density area. You'll find you're less likely to compete with your neighbours if you move to 5GHz. A related aspect is that 5GHz is less prone to interference from other devices, such as microwave ovens and cordless telephones.

Features you can expect to find in wireless routers (dual-band or otherwise) include DHCP reservation (so devices can keep the same IP addresses without having to configure them with a fixed address), virtual server (direct incoming IP traffic on a particular port to a specific device), port triggering, quality of service, MAC filtering, access control (eg. to restrict the kids' internet use), support for at least one dynamic DNS service, and a firewall.

Most of the products we tested here are routers, but we also included one access point. Access points are capable of adding wireless capability to an existing Ethernet network.

We tested wireless performance by timing a large file transfer between two computers: the source computer connected to the router via Gigabit Ethernet and the destination via wireless (using WPA2). This was repeated for 2.4 and 5GHz connections, and with the router initially adjacent to (and then as far from) the receiving computer (as possible) in the premises, requiring the signal to penetrate multiple plasterboard walls at around 45 degrees.

We made no attempt to optimise the positioning of the routers; each was placed in the same spot and orientation for testing. The idea was to compare how they performed under similar conditions. We used the default or recommended channel settings unless that led to a conflict with nearby wireless routers.

For comparison, that transfer takes around three minutes over our Gigabit Ethernet network.

What do I look for?

In a good Dual Band 802.11N router. . .

When buying a high speed wireless device, keep your eye out for MIMO compatible models. The multi antenna technology will improve throughput. Of course, try and match the access point with a dual band adaptor for best results.

POE

Power over Ethernet can be outstanding, provided you have the rest of the equipment to support it, otherwise you'll be buying a PoE converter just to get it to work.

ANTENNAS

Multiple antennas and a MIMO design means higher and more consistent throughput. It's not necessary to get to the top speeds, but it helps.

ETHERNET

Gigabit Ethernet will make transferring large files around your wired devices much quicker but won't change the speed of wireless devices.

MEDIA SERVERS

Built-in media servers can make sharing video and audio across your network simple. FTP and web servers means you won't need to set up a server to access your data online.

- SIMULTANEOUS DUAL-BAND 802.11N OPERATION
- DISK AND PRINTER SHARING
- GUEST MODE

$279

9
10

Apple AirPort Extreme Base Station

@ www.apple.com.au

✔ Good performance at 2.4 and 5GHz.

✖ No web-based configuration; only three Ethernet ports.

The gloss-white finish means it is more visually compatible with the previous generation of Mac hardware rather than the current aluminium look.

The fairly compact power brick comes with reasonably long mains and low-voltage cables, providing some flexibility in positioning. It has three wired ports rather than the usual four, but at least they are Gigabit Ethernet.

Instead of a web interface, Apple provides the AirPort Utility (Windows or Mac OS X) for the manual or wizard-style set up and ongoing management of the device. This is inconvenient, as it means you can't easily administer from any computer on the network — you have to install the utility first.

In addition to the usual features, AirPort Utility can show a graph of signal strength for connected wireless clients and configure the device for Back to My Mac (Apple's GoToMyPC-style service that comes as part of a MobileMe subscription).

Access can be controlled according to MAC addresses by day of the week (including weekday and weekend settings) and time of day. Setting no access as the default makes it that bit harder for outsiders to access your network.

If you don't mind sharing your internet connection with bona fide guests but you want to keep them out of shared volumes and other network resources, guest mode does the trick.

The AirPort Extreme can share disks and printers connected to the USB port, via a hub if you need more than one device. Access to shared disks can be controlled through the base station password, a disk password, or individual usernames and passwords. Guest access can be allowed or denied, and disk sharing can be extended to the WAN interface if required.

The AirPort Extreme turned in some of the fastest test results. At short range, the transfer took 6 min 16 sec at 2.4GHz and a speedy 3 min 54 sec at 5GHz. Long range saw a respectable 15 min 5 sec at 2.4GHz and 12 min 56 sec at 5GHz.

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- SAS interface for superb performance and durability (N7700SAS & N8800SAS)
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D-Link Xtreme N Duo Media Router DIR-855

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✔ Among the fastest short-range; conveniently formatted documentation.

✖ Poor long-range 2.4GHz performance

Boxy yet unobtrusive in off-white, the DIR-855 comes with a pair of screws for wall mounting, and a plastic foot in case you'd rather stand it on end. A noticeable feature is the compact but clear OLED display that presents various settings. It automatically shuts off after a brief delay, so doesn't become distracting.

A setup wizard is provided on CD (Windows only), but the router is also configurable via a web interface. D-Link includes a trial version of Network Magic, a well-regarded program for setting up and managing a small LAN. We took advantage of the DIR-855's auto channel scan feature to avoid conflicts with a number of nearby routers.

There are plenty of settings to tinker with if you're so inclined, and the web interface is quite easy to use. We just wish there was a way of making multiple changes before rebooting the router.

Setting up access controls is a bit of a chore, as you can't define a schedule as part of the process, and creating a schedule means rebooting the router. Furthermore, you can't say 'block everything unless I say it's OK' — the default is to allow traffic, and your controls shut it off. Conversely, the site filter can be used as a black or whitelist.

Router logs can be sent by email either when they are full or according to a schedule.

In addition to Wi-Fi, the DIR-855 includes the usual four Gigabit Ethernet ports. Other features include support for pushbutton or PIN-based WPS, traffic classification through WISH (wireless intelligent stream handling), and WLAN partitioning (which stops wireless devices from talking to each other — something that is more useful in a public or semi-public situation).

D-Link deserves praise for providing a PDF manual that's formatted for on-screen reading. We'd rather have a real manual, but if we're stuck with softcopy it shouldn't be designed for an irrelevant paper size.

The DIR-855 performed well at short range: 5 min 32 sec on 2.4GHz and 5 min 3 sec on 5GHz. It didn't fare so well at longer distances: the 5GHz test took a reasonable 10 min 14 sec, but we recorded a 'did not finish' on 2.4GHz, as the projected time was around 3 hours.

Linksys N Ultra RangePlus WRT610N

@ www.cisco.com

✔ Extended shared storage features; few reboots when changing settings.

✖ Poor long-range 2.4GHz performance; problems with manual

With an industrial design that resembles a car boot lid (complete with spoiler), the sleek WRT610N avoids the cluttered look that comes with external antennas. The high-gloss dark blue and black finish looks quite spiffy but is fingerprint-prone.

The setup program was very similar to D-Link's, but was not identified as using Network Magic technology. A Mac OS X version is included, which is a plus for mixed installations.

This router has a useful feature set, including a USB port to attach a shared storage device. It also acts as a UPnP media server and an FTP server for internal or remote access. These functions can be limited to specific folders, and the FTP server can be made accessible via the internet.

If you do use shared storage, don't forget to change the default user names or passwords — admin/admin is so easy to guess! Talking of security, the WRT610N supports WPS via button or PIN.

The access controls let you create schedules as part of the policy. We find this more convenient than having to define a schedule before access rules.

The WRT610N's rules can either block or allow internet access. One shortcoming is that only five policies are allowed, and each can selectively block a maximum of four URLs, four keywords and 10 applications (ports).

WMM is supported for QoS, along with four priority levels that can be applied to applications, online games, traffic from a specific MAC address or Ethernet port on the router, or voice devices (a special case of MAC).

We liked the way it isn't necessary to wait for the router to reboot almost every time you change a parameter.

As for performance, the WRT610N delivered reasonable short-range times of 8 minutes 17 seconds and 6 minutes 39 seconds at 2.4 and 5GHz respectively. At long range 10 min 36 sec at 5GHz was around par, but a predicted time of around 4 hours at 2.4GHz puts this router into the 'did not finish' camp.

- SIMULTANEOUS DUAL-BAND 802.11N OPERATION
- GIGABIT ETHERNET
- CLEAR AND USEFUL DISPLAY

$249

7/10

Netgear RangeMax WNDR3300

@ www.netgear.com.au

✔ Good long-range 5GHz performance.

✖ Poor long-range 2.4GHz performance; only 10/100 Ethernet.

One of the most obvious features of the WNDR3300 is the love 'em or hate 'em set of eight flashing blue LEDs under the top dome. There's one for each antenna, and the idea is to show which are receiving the strongest signals. Don't worry though, it is possible to turn them off. Another unfortunate characteristic is that the gloss-black top surface shows fingerprints like, well, like a gloss-black surface.

The slimline plugpack is convenient, and a pair of snap-on feet allows vertical mounting, which takes up less desk space. Netgear recommends that orientation, though it didn't seem to make any difference to the performance in our tests.

A weak point in the specification is that the four Ethernet ports are only 10/100M. That's no big deal if the only purpose of the wired network is to share an internet connection, but it could slow things down if you routinely load it up by streaming movies from a PC to a media player or transferring home video projects to or from a NAS unit. There's also no provision for shared USB drives or printers, but the WNDR3300 does support WPS through a PIN or by using the top dome as a pushbutton. As usual, setup is carried out via web interface, either manually or with aid of a wizard.

If you're a control freak, there's full-time or scheduled keyword and domain blocking with optional email notification. Only one schedule is allowed, but there's provision for one trusted IP address that bypasses the block. You'd need to use that in conjunction with address reservation. Particular services can be blocked by protocol or port for all or specified IP addresses.

Quality of Service is provided via WMM on the wireless side, plus four levels on the WAN connection, which can be set for particular applications, online games, Ethernet ports, and MAC addresses.

Our short-range test results seemed anomalous: 8 min 52 sec for 2.4GHz and 12 min 09 sec for 5GHz. Most of the devices we tested were quicker on 5GHz. The long-range test gave the fastest time of 9 min 58 sec at 5GHz, but we could not get a stable connection on 2.4GHz. Performance was consistent over repeated trials.

- PROVISION FOR EXTERNAL ANTENNAS
- ACCESS POINT ONLY
- POWER OVER ETHERNET

$1,721

7/10

HP ProCurve MSM422 Access Point

@ www.procurve.com.au

✔ Very flexible configuration, including multiple virtual access points.

✖ Uncertain performance

If you've got an adequate router, and just want to add Wi-Fi capabilities, an access point might be the go — though in a home or small business situation, a router upgrade might be a more economic proposition.

The HP ProCurve (ex-Colubris) MSM422 comes with a hefty metal mounting plate plus screws and wall plugs. No power supply is included, so you'll either need to connect it to a switch port providing Power over Ethernet (PoE), a PoE injector, or the optional 48V power supply. HP recommends that the MSM422 be professionally installed.

A pair of flaps containing the four antennas (by default, three for 802.11n in the upper flap and a single 802.11b/g antenna in the lower one) hinge out from the main body of the unit. There is also provision for connecting external antennas.

The access point provides a web interface for configuration and management. Initial setup is straightforward and carried out by connecting directly to a computer. It is usually necessary to assign a static IP address or set the router (or other DHCP server) to reserve one for the MSM422's MAC address.

The access point can then be connected to the network and any other configuration carried out. While it is designed to be used under centralised control, it can also operate autonomously.

It has a broad feature set with some interesting capabilities, including support for virtual service communities, prioritising traffic for SpectraLink VoIP handsets and isolating wireless clients. Other notable features include scanning for rogue access points, speed throttling of data heading to wireless devices, scheduled backup or restore of settings, scheduled install of new firmware, wireless mesh (so additional access points can be installed without Ethernet links) and a SOAP API allowing configuration and management tasks to be performed by other SOAP-compliant applications.

Our testing of the MSM422 showed remarkably slow file transfer, even at short range (around half an hour at 5GHz). We doubt these results reflect the true performance, but HP technical support was unable to resolve the issue before we went to print.

exploding tech

NO. 39 The LiveScribe Pulse SmartPen records audio and syncs it with your handwritten notes. With an OLED display, onboard camera, microphone and CPU, this is really a computer in a pen.

05
The high speed infra-red camera can process over 70 images per second to track the pen's movement.
The infra-red light source provides enough light for the LiveScribe Pulse to track its progress across the dotted page.
01
02
03
04
05
06

1 Connector for USB docking cradle used for PC connectivity and battery charging.
2 Rechargeable Lithium-Ion battery.
3 Lower body casing.
4 Pen nib and housing for infra-red camera.
5 Infra-red camera and sensor.
6 Insulation tape.
7 Speaker for audio playback.
8 Speaker mount.
9 Protective transparent screen for OLED display with on/off button.
10 OLED screen for function diplays.
11 OLED screen mount with connectors and on/off button.
12 Main board with 2GB flash memory, Samsung ARM 9 32-bit processor, power connections and 2.5mm headphone jack.
13 Main board mount.
14 Insulation tape.
15 Headphone jack cradle.
16 Upper body casing.

LiveScribe Pulse SmartPen

The LiveScribe Pulse uses dotted paper technology and an infra-red camera to track its own motion whilst recording surrounding audio. This gives users the ability to sync audio from a meeting, lecture or interview to their handwritten notes. Users can then tap directly on words or drawings with the Pulse to replay what was recorded from the moment they were writing. Users can also pause, fast-forward, rewind, slow down or speed up recordings using a printed toolbar within the notebook. With the LiveScribe Desktop software, users can transfer notes to their PC to back up, replay, search for words within their notes, and share them online. Notes can even be made into PDFs, diagrams or Flash movies.

Christopher Zammit

Best tech

APC's independent reviewers point to the best technologies in the top-selling product categories each month. We only change products when a better one comes along. What you see here is the best technology available on the market right now.

LOOK OUT FOR THESE

NEW

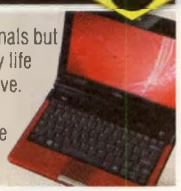
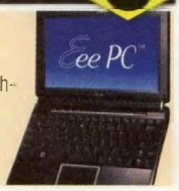
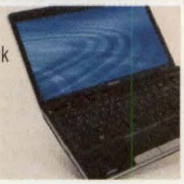
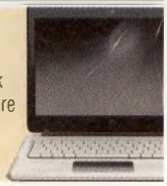
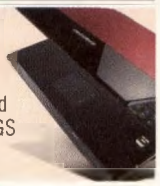
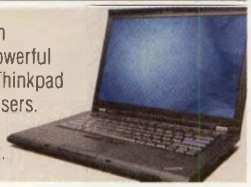
Products marked with this stamp are the latest additions to Best Tech.

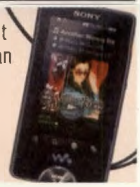
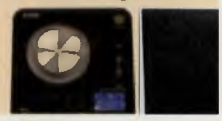
Movers & shakers

What's hot on the gear scene, for every budget.

It's hard to keep up with all the consumer phone releases, particularly now that the line between ordinary phones and smartphones is being blurred by devices like LG's Xenon. Looking like a smartphone but without the apps and sophisticated email handling, it's nonetheless excellent for compulsive texters because of its excellent Qwerty keyboard.

	NOTEWORTHY	BEST VALUE	BEST PERFORMER
GENERAL PC	**Acer Aspire X5810**	**TI Deluxe Phenom 810**	**Altech NRG Storm i7** NEW
	One of the first small-form factor PCs to offer full-size desktop performance, with a Core 2 processor (2.8GHz E7400), 2GB of RAM and a 640GB HDD.	Great-value system offering both 2D power and 3D performance. This is a PC that is genuinely better value than any Core i7-based machine we've yet seen. Recommended.	Not cheap, but with a Core i7 975 overclocked to 4.25GHz, this space shuttle booster will disorient you with the way it rips wait times to pieces.
	$999 > Acer > www.acer.com.au	**$1,950 > Trinity International > ticomputers.com.au**	**$7,899 > Altech > www.altech.com.au/nrg**
PANEL PC	**MSI Wind Top AE1900**	**Dell Studio One 19**	**Apple iMac 24 inch**
	Basically a nettop in a 19in touchscreen LCD, with optical drive too. Handy as a second PC.	Dell's iMac for the masses, with a 19in screen. We recommend the 3GB RAM/Pentium E5400 version as a starting point.	There's better value in PCs, but the 24in iMac's presence is stunning. The 2.66GHz version with 4GB of RAM is best, too costly beyond that.
	$1,099 > MSI > www.msicomputer.com.au	**$1,699 > Dell > www.dell.com.au**	**$2,499 > Apple > www.apple.com.au**
NAS HOME	**Linksys Media Hub NMH405**	**Iomega Home Media Network**	**My Book World Edition II**
	Automatically scours your network to find the multimedia files on attached systems, then copies or references them and plays them.	When nanna asks you what NAS she should buy, point her to this 1TB NAS designed to store and share images and multimedia across DLNA devices.	The ultimate backup and media storage for PC/Mac. Up to 4TB with mirrored RAID 1 drives and media streamer and iTunes server.
	$700 > Cisco > www.linksysbycisco.com	**$429 > Iomega > www.iomega.com.au**	**$999.99 > WD > www.westerndigital.com**

	NOTEWORTHY	BEST VALUE	BEST PERFORMER
EXTERNAL DRIVE	**Iomega eGO Triple Interface** NEW Stunning portable 320GB and 500GB drive, with a suite of software and FireWire 800 and 400 ports as well as USB 2.0. **$179 for 320GB > Iomega > www.iomega.com**	**Iomega Prestige Desktop** Good-value external drive that gives you an instant 500GB through your USB port. And it looks pretty good as well. **$150 > Iomega > www.iomega.com.au**	**Seagate FreeAgent Xtreme** No RAID mirroring but still gives you one terabyte of storage and FireWire, eSATA and USB 2.0. Extremely fast performance. **$480 > Seagate > www.seagate.com**
NETBOOK	**Fujitsu M2010** NEW Standard netbook internals but with exceptional battery life and a fast 5,400rpm drive. Also sturdier than most and better-than-average 2-year warranty.  **$749 > Fujitsu Australia > www.fujitsu.com.au**	**ASUS Eee PC Seashell 1005** NEW The latest netbooks in the Eee PC range, the Seashells have a scratch-resistant "opalescent" plastic frame, ship with XP and a 160GB HDD.  **$599 > ASUS > www.asus.com.au**	**BenQ Joybook lite U121** Fantastic machine. A next-gen netbook: amazing battery life, full keyboard, 11.6in screen. Get 2GB of RAM and you'll love it. **$899 > BenQ > www.benq.com.au**
NOTEBOOK ALL-ROUNDER	**Toshiba A500** Big brand, great-value entertainment notebook with a 16in screen, powerful graphics, HDMI connection and built-in TV tuner.  **$1,599 > Toshiba > www.toshiba.com.au**	**HP dv2-1001AU** A fantastic offering, melding the price and convenience of a netbook with the powerful hardware and comfort of a fully-fledged notebook.  **$1,199 > HP > www.hp.com.au**	**Samsung X460** Thin and light, but with a 2.66GHz Intel Core 2 Duo P9600 processor, 4GB of DDR3 1066MHz RAM, and NVIDIA GeForce 9200M GS graphics.  **$2,999 > Samsung > www.samsung.com.au**
DESKTOP REPLACEMENT	**Pioneer DreamBook M57T** Obscenely powerful notebook, with an Intel Core 2 Quad QX9300 Extreme processor running at 2.53GHz and 4GB of 1,066MHz DDR3. **$4,169 > Pioneer > pioneercomputers.com.au**	**MSI EX625** Awesome value with a 16in 1,366 x 768 resolution LCD display and an ATI HD 4670 GPU which packs a 512GB of DDR3 VRAM. Uses Centrino 2 chips and 2GB of RAM. **$1,399 > MSI > www.msicomputer.com.au**	**HP Pavilion dv7-2111TX** NEW An entertainment-focused desktop replacement, the dv7-2111TX has a Core 2 Quad processor, 17.3in widescreen, and ATI Radeon HD4650 graphics. Great HD movies. **$2,799 > HP > www.hp.com.au**
BUSINESS NOTEBOOK	**ThinkPad T400s** Gloriously thin 21mm) and powerful new T series Thinkpad for business users. Has DVD burner to boot.  **$ 2,899 > Lenovo > www.lenovo.com.au**	**Lenovo's ThinkPad X301** Lenovo's X ThinkPads look the part. The X301 is the latest in the line, with a 13.3in backlit widescreen display, 2GB RAM and 120GB HDD. **$2.924 > Lenovo > Lenovo.com.au**	**Toshiba Portege R600** Full-power business notebook in a netbook shell. Sub-1kg, yet with a 1.4GHz Core 2 Duo, 3GB of RAM, DVD burner and 200GB HDD/128GB SSD! **$3,300 > Toshiba > Toshiba.com.au**
PHONE BUSINESS	**Nokia E63** Great all rounder with amazing battery life (11 hours talk, 18 days standby) superb keyboard and necessary Nokia apps. Has Wi-Fi and 3G. **$399 > Nokia > www.nokia.com.au**	**Nokia E75** Works like a BlackBerry with the new Nokia Messaging push email service. You can configure up to 10 Gmail, Yahoo Mail, Live Mail and other free and hosted email accounts. **$979 > Nokia > www.nokia.com.au**	**BlackBerry Bold** The Bold is the most addictive BlackBerry yet, with built-in Wi-Fi and GPS, a stunning screen and DivX/XviD playback. It's still the best for email too. **Plan > RIM > www.blackberry.com**

	NOTEWORTHY	BEST VALUE	BEST PERFORMER
PHONE CONSUMER	LG Xenon NEW Not a true smartphone without Exchange sync and apps, but looks like one and comes with great keyboard. Perfect for habitual texters. $589 > Telstra > www.telstra.com.au	Sony Ericsson C510 Unprecedented set of high-end features for the money: HSDPA, Bluetooth, an accelerometer, GPS and custom social networking apps. 3.2MP camera with auto-focus. $389 > Sony Ericsson > sonyericsson.com.au	iPhone 3G S Glorious user interface, 3G speed, and now faster CPU, slicker graphics, can shoot video and take better photos. Plan > Apple > www.apple.com.au
MUSIC PLAYER	iPod Shuffle The 3rd-generation shuffle moves the playback controls into the earphones and has voice-over that tells you what song is playing. 4GB of storage carries up to 1,000 songs. $129 > Apple > apple.com.au	Apple iPod nano A new long narrow design with an accelerometer that kicks the nano into landscape mode when you hold it sideways. Now in 8GB and 16GB models. $199 > Apple > www.apple.com.au	Sony Walkman X This may be sacrilegious, but we think Sony's new Walkman X is better than the top iPod, with a 3.2in OLED touchscreen, noise-cancelling tech and Wi-Fi.  $649 (16GB) > Sony > www.sony.com.au
MP3 DOCKS	Altec Lansing octiv AIR M812 Unlike most other iPod docks, the dock and speaker connect to each other wirelessly up to 30m away. Produces a warm, well-balanced sound. $799 > Altech Lansing > alteclansing.com	TDK NX-04CD remote & Mic Audio performance blows similarly priced docks out of the water, and looks great. But it can also play music off USB drives and SD cards.  $300 > TDK > tdk-media.com	B & W Zeppelin Simply the best-quality iPod dock speaker system around, even if not the most expensive. So good you need 320Kbit/s tracks to get the most out of it. $1,300 > Bower-Wilkins > bower-wilkins.com
GPS	Uniden TRAX 430 GPS Comms company Uniden has released a ripper of a GPS device, impressing with its ease-of-use, exceptional screen and ability to create 3D maps. $379 > Uniden > www.uniden.com.au	TomTom ONE XL The most affordable TomTom that delivers the features that matter, with the same display and navigation engine of the more expensive TomToms. $399 > TomTom > www.tomtom.com	TomTom GO 930 The top-of-the-line TomTom delivers traffic messaging, intelligent live routing, FM transmitter, voice-recognition and text-to-speech. $849 > TomTom > www.tomtom.com.au
COMPACT CAMERAS	Ricoh CX1 One of the first compacts with a high-speed CMOS sensor to capture light at faster speeds and wider range of conditions. $599 > Ricoh > www.ricoh.com.au	Kodak M320 Easyshare The M320 is cheap, easy to use and produces great images. Takes a picture as well as a camera twice its price. $180 > Kodak > www.kodak.com.au	Canon IXUS 80 IS Probably the best digital compact on the market, with every function you could ever need but still at a great price. $379 > Canon > www.canon.com.au

Buying a new PC is smart

	NOTEWORTHY	BEST VALUE	BEST PERFORMER
DSLR CAMERAS	**Canon EOS 50D** Although better than the 450D, the 50D's price stops it being in the Best Value category. Still not as good as the Nikon D90 but still a great camera by any means. **$2,599 > Canon > www.canon.com.au**	**Canon EOS 500D** NEW The best low-price DSLR you can get. Suited to the amateur photographer, the 500D offers HD video and heaps of features in a tiny DSLR frame. **$1,499 > Canon > www.canon.com.au**	**Nikon D90** This is just sexy! The first DSLR with HD video, the D90 is the best non-professional camera you could get without sending yourself broke. **$1,699 > Nikon > www.nikon.com.au**
HD CAMCORDER	**Sanyo Xacti VPC-CG10** Looks like a Taser, but shoots hi-def video using MPEG-4 in 1,080 x 720 resolution. Much better cheapie than a Kogan Full HD camera. **$549 > Sanyo > www.sanyo.com.au**	**Sony HDR-CX100E** With the excellent mechanics and HD optics of Sony's new HDR range but with 8GB flash-storage. The most affordable Sony HD. **$1,199 > Sony > www.sony.com.au**	**Sony HDR-XR520V** Want the best consumer camcorder out there? With 240GB HDD storage capacity, 12MP still images and so much more. **$2,699 > Sony > www.sony.com.au**
PHOTO FRAMES	**D-Link DSM-210** 25cm Wi-Fi photo frame that streams net content and can accept content via a "widget" located on the PC desktop. **$499 > D-Link > www.dlink.com.au**	**Kodak P720 Touch Digital** Kodak's entry-level Photo Frame, with a good quality 7in screen and the excellent Quick Touch Border which makes it really easy to navigate menus. **$140 > Kodak > www.kodak.com**	**Samsung SPF-105V** Almost like a mini-TV with an impressive monitor and able to play MP3s and video files, plus lots of slideshow effects. **$399 > Samsung > www.samsung.com/au**
HDTV	**LG PS70** Features in-built "Time Machine" DVR recording. For this model, the PS70, just add a hard disk. **$3,299 for 50in > LG > au.lge.com**	**Panasonic TH-P42S10A 42** Panasonic's plasmas are now great value. This one has a superb picture, uses half the power of traditional plasmas and is Full HD. **$1,800 > Panasonic > www.panasonic.com**	**Samsung Series 9 46in** The first HDTV range to offer live internet content through RSS feeds, plus sophisticated LED backlighting produces blacks to rival plasmas. **$5,999 > Samsung > www.samsung.com.au**
TV TUNER	**Hauppage MiniStick-HD** NEW The size of a small USB key, it's the smallest Freeview-tuned digital TV stick in Australia — great quality, cheap, and perfect for notebooks. **$69 > Hauppage > www.newmagic.com.au**	**Kworld DVB-T 395UR** A basic HD tuner card that allows you to watch HD digital TV on your PC or notebook. It's not flash, but it works well, is portable and convenient. **$79 > Kworld > www.kworld.com.tw**	**Hauppage Nova TD** The Nova TD USB stick has two HD tuners, is designed specifically for Freeview and comes with excellent drivers and software. **$179 > Hauppage > www.newmagic.com.au**

Microsoft

Adding the right software is genius.

Office 2007 Get the ultimate tool for home, school and work.

Buy it for your PC. Office2007.com.au

Microsoft® Office

Real life tools.

	NOTEWORTHY	BEST VALUE	BEST PERFORMER
DISC PLAYERS	**Sony PlayStation 3 80GB** Yes, it's a games console, but it also doubles as a Blu-ray player that's as good as any standalone devices on the market. It's the same price as some of the better ones, so do your sums. $699 > Sony > www.sony.com.au	**Kogan Blu-ray Player** Basic, affordable. Plays back good quality HD and upscales DVDs. Now supports BD-Live (Profile 2.0) which it can receive internet content and firmware upgrades. Good buy at $249 . $249 > Kogan > www.kogan.com.au	**Sony BDPS350** Superb HD playback quality and does great upscaling of DVDs to high definition. Unlike the $1,799 Pioneer, available for around $400 on the street. $400 > Sony > Sony.com.au
DVR	**FOXTEL iQ2** If you watch pay TV, the FOXTEL iQ2 is a must. Records both standard and high-definition free-to-air TV to a spacious 320GB hard drive. $10 month > FOXTEL > www.foxtel.com.au	**TiVo HD** The TiVo's smart recording features (such as WishList) are the main reason you'd choose this DVR over the others, despite the fact that it won't record pay TV. $699 > TiVo > www.tivo.com.au	**Panasonic DMR-BW500** The ultimate high-definition DVR — can record two HD programs simultaneously to its 500GB hard disk or directly to Blu-ray media. A bucketload of connectors too. $2,199 > Panasonic > Panasonic.com.au
ROUTER	**D-Link Xtreme N Duo DIR-85** NEW One of the fastest dual-band gigabit routers we've tested over short range, useful OLED display, and comes with great user documentation. $479.95 > D-Link > www.dlink.com.au	**TP-Link TL WR941ND Wireless N** A Draft 2.0 N router with MIMO, using three adjustable antennas for speeds of up to 200Mbit/s. Performance is decent and the documentation is good. $129 > TP-Link > www.anyware.com.au	**Linksys Dual-N WRT610N** It does dual-band Wireless N (5GHz and 2.4GHz), is one of the best performers in testing and looks great. Comes with Linksys' superb LELA network setup wizard. $290 > Linksys > linksys.com.au
PRINTER HOME	**Canon Selphy ES2** A dye sublimation printer, the Selphy can print directly from every variation of memory card and even from mobile phones, and you don't need a computer. $299 > Canon > www.canon.com.au	**HP Color LaserJet CP1215** It's not the fastest colour laser out there, but it has two things going for it: the HP LaserJet heritage and its price, which is well-affordable home use. $299 > HP > hp.com.au	**Samsung CLP-350N laser** The first in the Samsung lineup of excellent affordable colour lasers, with all the specs to meet basic home or business requirements. $399 > Samsung > Samsung.com.au
PRINTER — SMB	**OKI B430dn** If you're looking for a solid workhorse mono laser, OKI's B430dn is perfect for the task, and should keep many small businesses happy. $875 > Oki > www.oki.com.au	**Dell 2130cn** Dell is becoming synonymous with value in business printers. Its 2130cn is a good entry-level, biz-grade colour laser, with a duty cycle of 40,000 pages/mth. $499 > Dell > dell.com.au	**HP Color LaserJet CP3525x** On the expensive side, but the CP3525x provides Gigabit Ethernet in addition to USB 2.0. Great if you feel the need for speed and can put up with some noise. $2,403 > HP > www.hp.com.au
MFC	**Canon MX860** Canon's MX860 is a full-function inkjet MFC aimed at the lower end of the SMB market, with USB 2.0, 802.11b/g and 10/100 Ethernet. $299 > Canon > www.canon.com.au	**Epson Stylus Photo TX800FW** This stylish MFC will look great in a home office — but it also produces good photos and good copying results. Can also be shared across a network. $399 > Epson > www.epson.com.au	**Brother MFC-6490CW** If your business needs an A3 printer, the Brother MFC-6490CW is a good choice. Includes both Wi-Fi and Ethernet interfaces. $549 > Brother > www.brother.com.au

61 ownerbuilder

FROM THE READERS OF APC

APC MAGAZINE OWNER BUILDER READER PC

masterbuilder@acpmagazines.com.au

Submit your PC configuration to *APC*'s Master Builder and, if chosen to appear in the mag, you will win a Logitech Cordless Desktop S520. Worth $129.95, it's the perfect keyboard and mouse combo for your flat screen. With a long battery life of up to 15 months for the keyboard and 8 months for the mouse, the combo is stylish, compact, convenient and comfortable. Send your PC configuration to masterbuilder@acpmagazines.com.au in exactly the same format as published on this page.

Powerful but affordable gaming PC

Daniel thinks it would be hard to beat his gaming system for value.

CORE SYSTEM

SYSTEM COST $1,041

Daniel De Vries, 24, is a PC hardware enthusiast who enjoys overclocking and benchmarking. He sent in a gaming system configuration he built for a friend which he reckons is better and cheaper than previous machines featured. From Fortitude Valley in Brisbane, De Vries is an aircraft maintenance engineer, specialising in flight simulators (he says they're just "a big computer game really").

CPU

Intel E7500 CORE 2 DUO — $159

[2.93G 3MB Cache 1,066 FSB]

In my opinion, this CPU is well worth the step up from the E5XXX series, for the added gaming performance gained by the extra cache. We are going to overclock this baby to squeeze every last iota of performance from her.

COOLER

Cooler Master Hyper N520 Cooler — $75

From experience I know that this cooler performs very well, and a good cooler is a must when overclocking your CPU.

MOTHERBOARD

MSI P45-NEO-F INTEL P45 LGA775 ATX — $112

Great-value with a P45 chipset that performs well. An expensive, feature-rich mobo isn't needed when building a value machine. The money is better spent on CPU/GPU combo.

MEMORY

Kingston DDR2 4 (2x2G) PC6400 800MHz — $63

I wouldn't even think of building a system without at least 4GB of RAM at these prices! I'm not too fussed on running 1,066MHz DDR2. As we are working to a budget here, the limited performance increase doesn't justify more expensive memory.

GRAPHICS

Zotac GTX285 1G — $399

[DVI HDMI PCIE2]

You can't go past Nvidia for the money. This is the highest-performing single GPU on the market. Video encodes done with these cards come out with far better image quality than ATI's do. Also, being a part-time Linux user, Nvidia's Linux drivers are far superior to ATI's.

HARD DRIVE

Hitachi 500G SATA 7200RPM - $68

Again, working to a budget here, we go for a decent mixture of size and performance. 7,200rpm is a minimum. Good value for money with this disk. You don't need 1TB for gaming.

POWER SUPPLY

CoolerMaster 650W Extreme Plus - $109

This power supply with 2x 6/8pin PCI-e connectors is great value for money. Also, I do like to try to keep some similar branding throughout the build where I can (as long as it's not to spite performance).

CASE

CoolerMaster Centurion RC330 Elite Black - $56

Cheap but reliable case.

EXTRAS

MONITOR

BenQ G2411HD 24inch Wide Full HD LCD — $286

Great value for money with this screen. You can watch 1080p rips on it (or actual BDs if you want to spend up on a reader).

KEYBOARD

Razer Arctosa Gaming Keyboard — $57

You need a quality keyboard. Not enough emphasis is put onto input devices. They can make or break your gaming experience.

MOUSE

Razer Diamondback 3G Earth Green Infrared Precision Gaming Mouse — $65

You definitely need a good-quality mouse to game with. Fast-paced first-person shooters put a large demand on your mouse.

OPERATING SYSTEM

Windows 7 Home Premium — $199

After using the release candidate for a few months now, it's plain to see that Microsoft's latest OS will massively outperform Vista.

TOTAL WITH EXTRAS: $1,648

APC reader and Owner Builder, Daniel De Vries.

masterbuilder

HOW TO BUILD THE ULTIMATE PC

APC MAGAZINE MASTER BUILDER PRO BUILD

One of the joys of computing is building your own PC. Each month a Master Builder will configure a PC for a specific task and pricepoint, recommending the best components for the job. But we also want to know what you, our readers, are building, so Owner Builder is your showcase.

Build a Core i5 PC

Master Builder **David Kong** builds the first Core i5 PC with performance and reliability in mind.

Intel's new mainstream CPU, the Core i5, goes with motherboards based on the new P55 chipset. So we've asked a builder of high-performance PCs, Enspire Digital's David Kong, to build us a PC using a Core i5 and one of the hottest new P55 motherboards, the ASUS P7P55D. We wanted a PC whose overall characteristic was performance and reliability, so Kong felt the KISS (keep it simple stupid) approach would be best. Kong said: "Keeping things simple ensures that there are fewer things to go wrong or less to troubleshoot if they do. That means no RAID setups, which tend to cause more problems than they solve, no multi-card graphics card setups and only proven technologies."

CORE SYSTEM

SYSTEM COST $2,454

CPU

Intel Core i5 750 $270

We've chosen the exciting new Intel Core i5 750 processor running at 2.66GHz. With a dual-channel DDR3 memory controller and a more matured implementation of Turbo Boost Technology, which offers better performance for non multi-threaded applications, the Core i5 750 is our top pick for performance and value.

CPU COOLER

Thermalright Ultra-120 Extreme (with bolt through kit) $130

Thermalright make some of the best air coolers around, with excellent mounting systems. Its Ultra-120 Extreme is the best cooler at the moment and offers superb cooling and low noise.

MOTHERBOARD

ASUS P7P55D $270

We use ASUS boards because they tend to be the most reliable. For this system, we've gone with the ASUS P7P55D, which is based on the new Intel P55 chipset and is from its new Xtreme Design range. This includes its "Hybrid" technology, which helps overclocking with active cooling and intelligent O.C. management. The good board layout, good phase modulation and good quality parts makes this an easy choice.

MEMORY

Patriot Signature Series 1,333MHz DDR3 4GB Kit $105

This series was designed with reliability and value in mind, and the SPD timings will work at standard voltages without fiddling with the BIOS settings. Nice and simple, which is what we want.

GRAPHICS CARD

ASUS GeForce GTX 285 $555

Whilst an SLI or CrossFire setup would ultimately be faster, a simpler single-card solution is the way to go for the majority of users. The GeForce GTX 285 is the fastest single card you can get at the moment, and ASUS makes a very good card.

POWER SUPPLY

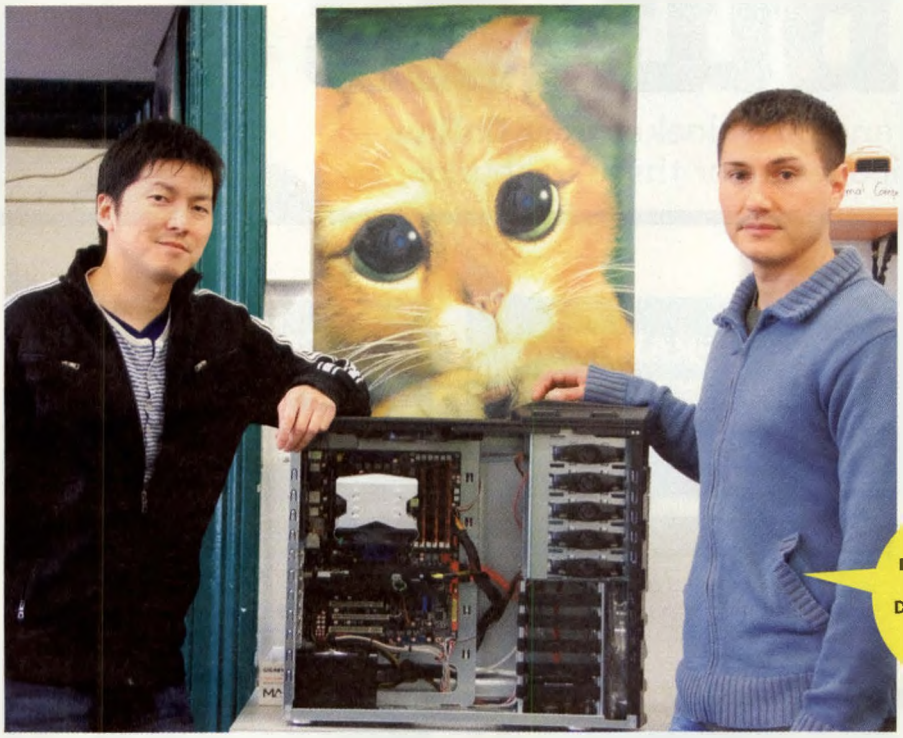
Seasonic S12 650W $180

Simple, very efficient and very quiet, the Seasonic S12 power supply hits the sweet spot. These are great power supplies, with plenty of power to run high-performance parts, a reasonable price and backed by local support from the distributor.

CASE

Coolermaster HAF 932 $228

The glowing red fans might put a few people off, but the Coolermaster HAF 932 offers the best airflow we've seen in a case, with three 200mm case fans configured in a positive airflow



Enspire Digital's master builders, boss David Kong (left) and Carlos Garate.

PRO OPINION

DAVID KONG COMMENTS ON OWNER BUILDER DANIEL DE VRIES' PC

SEE PAGE 61

Daniel has chosen a decent spec for his gaming system, allocating most of his budget to the graphics card. But if he wants to overclock it, the cheaper case, power supply and motherboard can be limiting and reduce long term reliability. With only a single rear fan, the case will need at least a front intake fan to avoid overheating. The budget MSI board lacks cooling on the voltage regulators for the CPU and can't really supply large amounts of current for overclocking. The Coolermaster 650W PSU is loud and not particularly efficient. I'd go with a better quality PSU and slightly larger case with better air flow and drop the graphics card down to a GTX 275. At stock speeds, though, his choice of components would make a good gaming system.

configuration. The case moves so much air that the enemy of reliability, dust, never gets a chance to settle.

HARD DRIVE

Patriot TorqX M28 128GB $640

SSD drives are fairly new to the consumer market but offer some pretty tantalizing benefits such as near-instant seek times, very fast read and write speeds and no moving parts. The Patriot drives use the latest Indilix controller with 128MB cache for super fast performance, and its offer an industry-leading 10-year warranty to boot.

OPTICAL DRIVE

ASUS DRW-24B1ST $77

Not the most exciting component in a computer system, but needed nonetheless. I've chosen the ASUS burner because of its fast 24X write speeds, which is as fast as it gets, as well as its power-saving feature and good software bundle.

What dreams are made of: a new Core i5 based on the P55 chipset, all wrapped up in a Coolermaster HAF 932.

EXTRAS

MONITOR

ASUS VW246H $337

The ASUS VW246H gives you a full HD 24in with DVI and HDMI inputs and a set of built-in stereo speakers. A 2ms response time ensures no blurring in games and full HD resolution means no annoying bars in high-def videos.

KEYBOARD

Logitech Illuminated $129

The Logitech Illuminated is my current favourite keyboard. Thin, super sexy and with a nice clicky feel it's in keeping with our KISS philosophy, no wireless: just a simple USB cable.

MOUSE

Logitech MX518 $51

The PTFE feet means the mouse glides over any surface smoother than a baby's bottom and the super high resolution can handle gaming and creative work with ease.

Total cost with extras: $2,971

Best builds

Advanced system builder and overclocker **Josh Collins** recommends the best components for three PC builds.

JOSH COLLINS
Josh is one of the world's foremost overclockers. His expertise is often sought by component makers.

	BUDGET $970	MID-RANGE $2,788	MIDGET P55 BEAST $2,875
CPU	Intel Pentium E5200 2.5GHz Ultra-cheap entry-level CPU which can be overclocked to perform like a more expensive CPU, such as an E7300. Intel > www.intel.com $100	Intel Core i7 920 The baby of the Intel Core i7 family blows away its predecessors with its multi-processing. Requires an X58-based motherboard. Intel > www.intel.com $370	Intel Core i7 860 NEW Great potential at stock and highly overclockable to boot. Early testing is proving it could potentially be another 4GHz stable 24/7 processor. Intel > www.intel.com $400
COOLER	Intel stock cooler A third-party cooler isn't a necessity at this level and allows for this system to hit the $1,000 price point. Intel > www.intel.com $0	Noctua NH-U12P NEW The LGA775 version of this heatsink became renowned for high performance while maintaining a stealthy operation. Noctua > www.noctua.com.at $85	Tower-style heatsink NEW Only tower-style heatsinks are available for the LGA1136 socket. Maximum heatsink height is 82mm due to the Silverstone SG01-F. Intel > www.intel.com $00
MOBO	Gigabyte GA-EP45-UD3L Ultra-Durable 3 and Dynamic Energy Saving (DES) technologies paired with good performance and it can handle some overclocking. Gigabyte > www.gigabyte.com.au $140	Gigabyte GA-EX58-UD3R MB Stable and reliable under both stock and overclocked conditions; also supports both NVIDIA SLI and ATI CrossFireX technologies. Gigabyte > www.gigabyte.com.au $270	Gigabyte GA-P55M-UD4 NEW Gigabyte has a full range of P55 motherboards coming for the Intel LGA1136. This micro-ATX based board is perfect for a midget beasty. Gigabyte > www.gigabyte.com.au $230
RAM	Corsair CM2X2048-6400C5 DDR-800 performance with CAS5-based latencies. Provides sufficient memory for basic computer usage and there's room for an upgrade. Corsair > www.corsair.com $40	Patriot PVT36G1600LLK 6GB Growing ever stronger in the Australian market, Patriot now provides a well-performing 6GB triple-channel kit to the masses. Patriot > www.patriotmemory.com $200	Corsair CMD4GX3M2A1600C8 NEW Competitively priced dual-channel DDR3-1600 kit based on a 2 x 2GB configuration and latencies of 8-8-8-24 — perfect for this budget. Corsair > www.corsair.com $199
GRAPHICS	Sapphire HD 4770 The first affordable card to use GDDR5 memory, and with a 40nm core. It'll run most games on a 22in screen in nearly full resolution. Sapphire > www.sapphiretech.com $160	Sapphire HD 4890 1GB GDDR5 NEW Offers HDMI output direct from the card (no dongle required) and a custom heatsink to keep the RV790 core cool. Sapphire > www.sapphiretech.com $275	NVIDIA GTX 295 NEW You can pick up an Nvidia GTX 295 from the likes of Zotac, Galaxy, Point of View (POV), Palit etc. for around the $620 mark. Nvidia > www.nvidia.com $620

	BUDGET	MID-RANGE	MIDGET PS5 BEAST
HDD1	WD Caviar Green 500GB An extremely affordable option, offering 500GB of space at a mere 15 cents per gigabyte. Western Digital > www.westerndigital.com $75	2 x Western Digital Caviar Black 1TB Setup in either RAID 1 or RAID 0, these two RAID-ready disks can provide HDD-based performance or a solid backup solution. Western Digital > www.westerndigital.com $280	G.Skill Falcon 64GB SSD NEW SATAII 2.5in MLC-based SSD based on Indilinx Barefoot design: features a great balance of speed and performance for the cash. G.Skill > www.gskill.com $249
HDD2	None needed (At this price point, there's no budget for a second drive.) N/A	G.Skill Falcon 64GB SSD NEW SATAII 2.5in MLC-based SSD based on Indilinx Barefoot design: features a great balance of speed and performance for the cash. G.Skill > www.gskill.com $249	Western Digital Green 2TB NEW WD's latest monster, this time topping the storage scales at 2TB. Perfect as a dump drive for all of your legitimately purchased media. Western Digital > www.westerndigital.com $299
OPTICAL	Pioneer DVR218L With optical drives having gone up in price recently, the Pioneer DVR218L provides solid performance and at a decent price. Pioneer > www.pioneer.com.au $65	Pioneer BDC-S02 Blu-ray/DVD NEW Plays Blu-ray discs and burns DVD discs. Ready for Blu-ray playback (and out to an LCD or Plasma TV via the Sapphire HD4890 HDMI). LG > www.pioneer.com.au $175	Pioneer DVR218L It doesn't have to be a DVD optical drive, but it helps when making slipstreamed installations with drivers and apps pre-installed. Pioneer > www.pioneer.com.au $60
PSU	OCZ StealthXStream 500W SLI Though certified for SLI, this will also do the trick should you choose to throw in a second HD 4770 later on for a CrossFire configuration. OCZ Technology > www.ocztechnology.com $95	Corsair TX750 An excellent-quality power supply with a massive 60A single rail, it's capable of fulfilling any reasonable power requirements. Corsair > www.corsair.com $220	Corsair HX750 NEW Unlike the rest of the HX series from Corsair, the HX750 sports a single 12v rail spitting out a powerful 62A. Corsair > www.corsair.com $225
CASE	Cooler Master Elite 331 A winner with many budget system builders, the Cooler Master Elite 331 offers a good looking chassis and decent build quality. Cooler Master > www.coolermaster.com $60	Lian-Li PC-60FW Black Simple and stylish case with all the room needed for a mid-range system. Made of aluminium with the classic Lian-Li build quality. Lian Li > www.lian-li.com $200	SilverStone SG01-F NEW A wickedly small but capable PC case which can support micro-ATX motherboards and regular-sized ATX PSUs. SilverStone > www.silverstonetek.com $109
MONITOR	BenQ E2200HD A 21.5in Full HD widescreen LCD monitor offering 5ms response times, 1,920 x 1,080 resolution and dynamic contrast ration of 10,000:1. BenQ > www.benq.com.au $235	BenQ G2412HD 24in widescreen LCD that's capable of full high definition, with all the necessities and under $300. Enough said. BenQ > www.benq.com.au $280	BenQ E2200HD Supporting Full HD resolution of 1,920 x 1,080, this offers value and will allow you to test your GPU using the X-preset in 3DMark Vantage. BenQ > www.benq.com.au $235
KEYBOARD	Logitech Ps II Keyboard and Mouse An affordable but effective combo. Combining packages of keyboard and mouse is the best way to stick to a budget. Logitech > www.logitech.com.au $20	Logitech G15 NEW At $99 the G15 is a solid purchase for any keen gamer looking for a keyboard with an LCD display and macro keys. Logitech > www.logitech.com.au $99	Logitech G15 NEW At $99 the G15 is a solid purchase for any keen gamer looking for a keyboard with an LCD display and macro keys. Logitech > www.logitech.com.au $99
MOUSE	N/A Combinations of keyboard and mouse are the best options when trying to keep your peripheral costs down. (As above.) N/A	Razer Diamondback 3G Featuring a 1,800dpi infra-red sensor, seven programmable buttons and on-the-fly sensitivity adjustment. Great for gamers. Razer > www.razerzone.com $60	Razer Lachesis NEW Equipped with a 4,000dpi laser sensor, 9 buttons total and symmetrical design; allows equal touch for both lefties and righties. Razer > www.razerzone.com $110

BUSINESS WAITS FOR WINDOWS 7 SP1

With the imminent launch of Windows 7, businesses and IT pros tell APC's **James Bannan** they'll soldier on with XP and Vista and wait until SP1, thanks.

Businesses and IT pros have had just under seven months to get to grips with Microsoft's latest operating system. Compared with Windows Vista's lengthy public beta period before release, Windows 7 has been available for testing for a comparatively short time. From the first beta release in late January to the release to manufacturing (RTM) build in mid-July, and with the imminent public release in October, there's been just four months in which to start testing it.

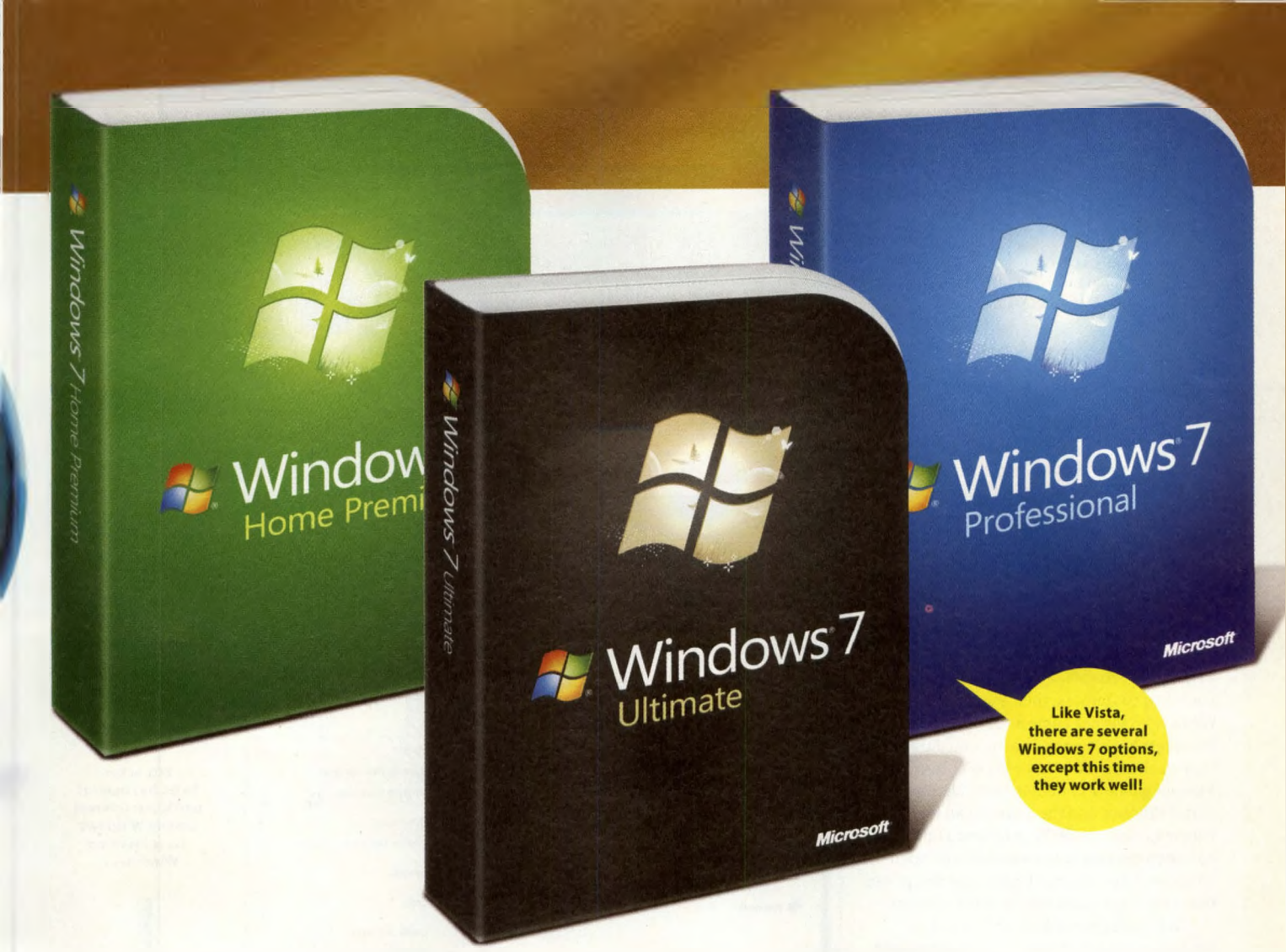
Businesses are notoriously conservative when it comes to changing operating systems, and Windows Vista's missteps may have served to enhance that conservatism with any new Redmond OS. On the other hand, Windows 7 has had an extremely positive public reception and a smooth run to RTM, so to what extent has business taken this into account?

The first thing to point out is that, unlike with Windows Vista, Microsoft has spent a lot of time liaising with businesses and IT pros during the public phase of Windows 7's development cycle, discussing the benefits of the new OS and, most importantly, how to deploy it. Guidance on deployment and image development was thin on the ground with Vista, and given the various bugs and stability problems that were present both during the development cycle and at RTM, many businesses were reluctant to migrate or simply not in a position to do so. Vista's value propositions became much clearer with the release of Server 2008 and Vista SP1, but with Windows 7 already on the horizon in early 2008, many businesses decided to wait.

With the side-by-side development of Windows 7 and Server 2008 R2, Microsoft has made available the necessary technology to test deployment scenarios, as well as the next versions of supporting products like Microsoft Deployment Toolkit (MDT) 2010 and System Center Configuration Manager (SCCM) 2007 R2. This shows business that the technicalities of a Windows 7 migration have been fully investigated. Microsoft has backed this up throughout the year with plenty of articles, webcasts, presentations and face-to-face communication, effectively saturating the market with product knowledge and creating a richer environment for Windows 7 to flourish in than that which Vista enjoyed.

WILL BUSINESS MAKE THE JUMP?

The big question is whether Microsoft's efforts and the publicly lauded quality of the product will result in widespread business uptake.


Windows 7 Home Premium
Windows 7 Ultimate
Windows 7 Professional
Microsoft
Like Vista, there are several Windows 7 options, except this time they work well!

"All of my customers who are looking at some sort of SOE development project are going to deploy Windows 7," says Craig Fiegert, a Melbourne-based solutions consultant, "whereas they all chose to give Vista a miss. Having said that, they are mostly planning to wait until the first service pack is released. Not because they think the product has problems, but from a general sense of caution. They prefer to wait until the first service pack of *any* product is released before deploying it, not just Windows."

In spite of this natural reluctance to implement brand-new technology, Fiegert's customers are nevertheless in the process of changing their back-end processes and deployment infrastructure, streamlining the path to a future migration to Windows 7. But why didn't the general availability of Windows Vista trigger this change? Microsoft has consistently stated that the technologies used to deploy Vista and Windows 7 are so similar that businesses planning to deploy the latter should be working with the former, so why hasn't Vista been the focus of deployment projects?

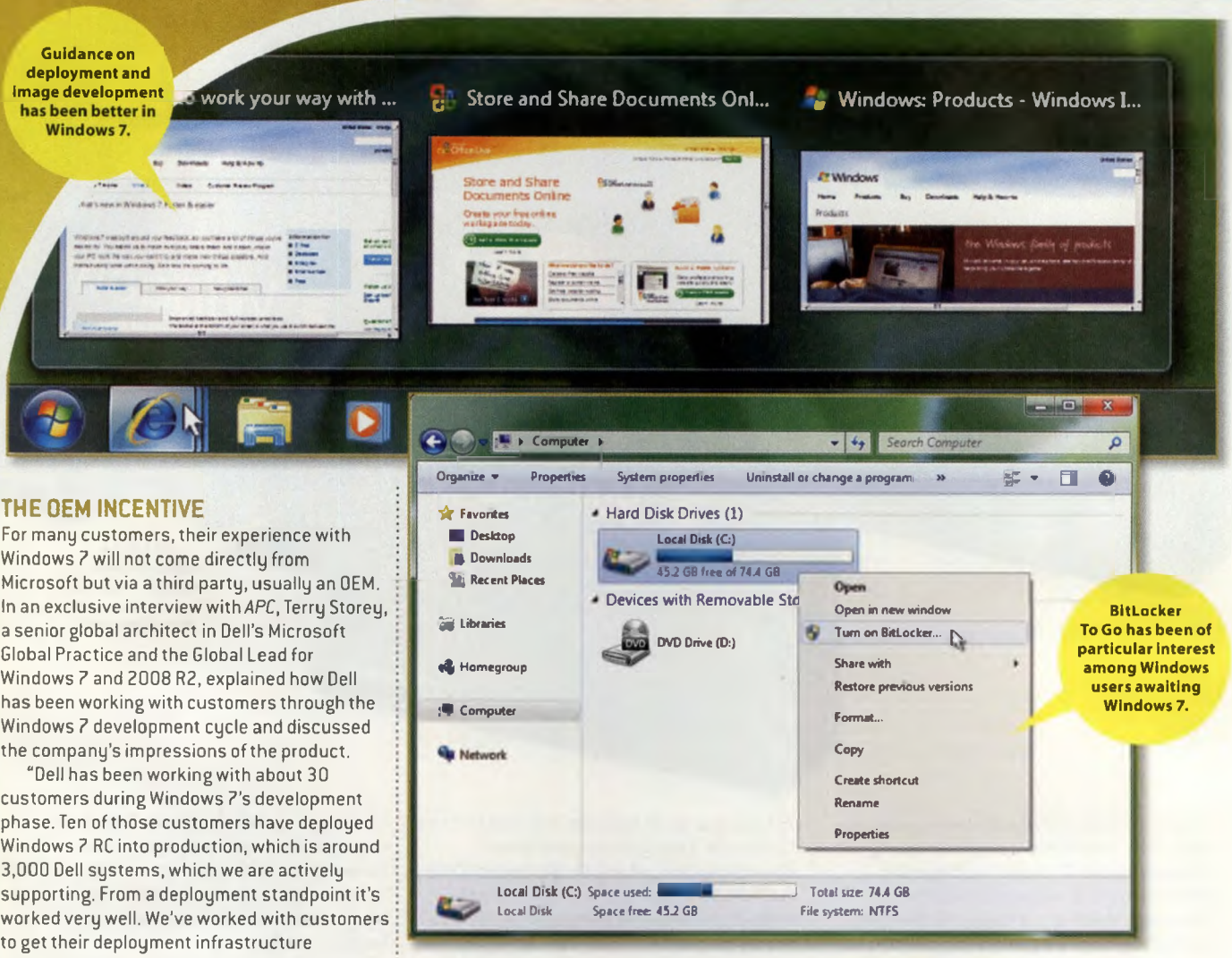
Fiegert's opinion is that apart from its other initial faults, Vista was the victim of bad market timing. "The majority of corporate customers I'm talking to are at a change-over point in their PC lifecycle. A few years back standard business systems started to get decent CPUs and RAM, so corporates have been able to string out a traditional three-year turnover to four or five years simply because they can — the machines are still doing a good job. When Vista came onto the scene the hardware didn't really need changing over from the perspective of business requirements, and combined with the early horror stories there simply wasn't enough of a compelling reason to change operating systems.

"Vista was tarnished very early on and never really recovered, but with Windows 7 everyone seems to be saying the same thing — that it's a quick, solid and stable product. There's a lot of confidence surrounding it."

The hardware environment in which Windows 7 will be a major player is certainly very different from that into which Vista emerged. The prevalence and affordability of performance systems combined with the fact that Microsoft has, for the first time in its history, built an operating system with hardware requirements that aren't greater than its predecessor, means that most systems bought within the last few years will quite happily run Windows 7.

This is a massive incentive for businesses, which can choose to handle an operating system migration separately from a hardware refresh, without one being dependent upon the other, as was the case with Vista. There's also a certain level of confidence, which is available when considering an operating system that has been optimised to run on multiple platforms, from a low-power netbook to a high-end gaming desktop, and Microsoft has been working very hard with hardware vendors to ensure that device compatibility and support is not a problem for Windows 7 customers. Given the large-scale availability of drivers via Windows Update, it seems that these efforts are paying dividends.

> WINDOWS 7 IS A QUICK, SOLID AND STABLE PRODUCT.



THE OEM INCENTIVE

For many customers, their experience with Windows 7 will not come directly from Microsoft but via a third party, usually an OEM. In an exclusive interview with *APC*, Terry Storey, a senior global architect in Dell's Microsoft Global Practice and the Global Lead for Windows 7 and 2008 R2, explained how Dell has been working with customers through the Windows 7 development cycle and discussed the company's impressions of the product.

"Dell has been working with about 30 customers during Windows 7's development phase. Ten of those customers have deployed Windows 7 RC into production, which is around 3,000 Dell systems, which we are actively supporting. From a deployment standpoint it's worked very well. We've worked with customers to get their deployment infrastructure managing Windows 7 images, using both third-party tools like CA and Altiris and with Microsoft tools like SCCM. The third-party companies have worked closely with Microsoft to get their tools supporting Windows 7 much earlier than we saw with Windows Vista, and this has enabled us to deploy Windows 7 earlier and with far fewer problems."

As a leading hardware manufacturer and OEM, Dell is very well positioned to comment on how Windows 7 is poised to interact with the market. "Windows 7 requires less hardware resources, and its use of triggered services means that there are fewer background tasks, more processing time for foreground tasks, fewer processes requiring less memory and a reduced attack surface," explains Storey. "We've extensively tested Windows 7 on our notebook and desktop products over the past fourteen months, and our message is that we will support Windows 7 not just on our current product ranges but on our older ones as well. There was no way that customers could roll out Windows Vista onto older hardware, but with Windows 7 they can and we'll support them. We will also support Server 2008 R2 on some of our older server hardware. This has been of particular interest to our government, public sector and education sector customers."

The market might be ready for Windows 7, and OEMs have put their weight behind it, but how long before it starts ousting Windows XP?

"Windows XP is still a good business platform, so I think that initially it's the consumer market which will drive the move to Windows 7, where it will be a completely viable alternative to Windows XP in the notebook and netbook market. This will then feed into the business market. Additionally, Windows XP is getting on. It's very expensive for OEMs to support XP and Vista as well as Windows 7, and as primary support for Windows XP has gone, ISVs and OEMs will be looking to drop support for XP. This will result in plenty of market force pushing the move to Windows 7."

FEATURE RICH?

When a new product comes to market, customers and media spend a lot of time going over the feature sets — what's new, what's different and what's been done away with. Windows 7 has been no exception, but for products like operating systems it's always very interesting to see which features appeal to home users and which ones to businesses and whether there is any cross-over, as the two market segments are generally driven by very different needs.

Jeff Alexander, IT Pro Evangelist for Microsoft Australia, and Sarah Vaughan, Commercial Group Lead for Windows 7 for Microsoft Australia, have both spent a lot of time talking to corporate customers about Windows 7 and have received extensive feedback about which features are the big ticket items for business.

"Application compatibility has been a big issue for customers," explains Alexander.

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"So many businesses out there are still running custom-developed internal line-of-business applications, which are in many ways more important to their day-to-day business than the operating system, but those applications are often old and inflexible and are proving to be a stumbling block to change. Microsoft has been working hard with ISVs to make sure that their applications work on Windows 7, and for customers with their own products, XP Mode ensures that their legacy applications won't hold them back from migrating."

"BitLocker To Go has been of particular interest," adds Vaughan. "With the prevalence and affordability of high-capacity portable storage devices, so many of our customers have horror stories of sensitive company data going missing. Now we can offer a centrally-managed solution to this problem."

"IT pros have been very enthusiastic about the product since the public releases," says Vaughan, "but they are often not the decision-makers within a business when it comes to major IT projects. However, many of our customers' CEOs have heard a lot about Windows 7 and have then gone to their IT pros for more information or to get the pre-RTM builds installed on their own systems. We've had positive feedback about the performance from different types of users."

This does seem to square solidly with industry experience — it's not simply a case of Microsoft cherry-picking favourable feedback. "Once they've been trained up in the UI differences," says Terry Storey, "the feedback Dell has been receiving is that users are working faster and more productively, and that they are better able to find data both locally and across the network."

"All of my customers have commented on the speed and slickness of the user interface," agrees Craig Fiegert, "and all the business IT pros appreciate the lack of UAC prompting, which was such an irritation in Windows Vista. Having said that, I don't think that UI appreciation will flow through to end users, to whom the operating system is just a tool they need to get the job done. Unless they've recently upgraded their home system, most business users aren't that interested in which OS their company runs."

> [WE'VE HAD SO MUCH POSITIVE FEEDBACK ABOUT PERFORMANCE]

A SLOW MOVE

It's fair to say that from the perspective of its business clients, Microsoft has quite a lot riding on the success of Windows 7. Windows XP is on the way out and Windows Vista didn't manage to get a proper foothold as a corporate SOE. Windows 7 is under strong pressure to be the client operating system that will allow businesses to journey into the world of next-generation computing.

Previously the senior vice-president for the Windows and Windows Live Engineering Group, Steven Sinofsky was in charge of the team that brought Windows 7 to market. In an internal email announcing his promotion to president of the Windows division, Microsoft CEO Steve Ballmer stated that "Windows 7 is receiving terrific feedback from customers, partners, analysts alike, and the entire Windows team has done a great job."

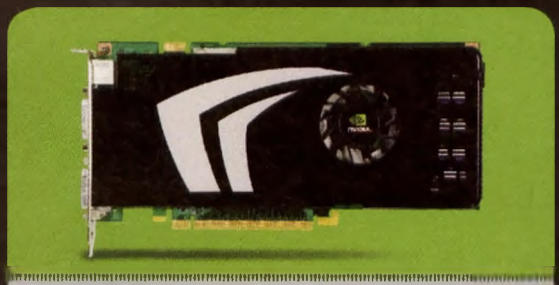
Feedback coming in from industry suggests very strongly that Ballmer's statement isn't simply a case of internal product hype. Whereas Windows Vista came into being under a cloud of hesitation, confusion and concern, Windows 7 is striding ahead with no apparent anchors holding it back. Certainly we should expect to see an explosion of rapid take-up in the consumer market, and this always puts pressure on businesses to follow suit.

However, businesses are by nature conservative, and migrating to a new operating system is a very big deal regardless of the product quality. Many if not most corporate customers will hold back from an early adoption, simply because that's what they do. But, regardless of any delay in deployment, no-one is talking about skipping Windows 7 and completely and sticking with the status quo. Businesses are forging ahead and 2010 will be the year of Windows 7.

MORE THAN JUST GRAPHICS PERFORMANCE

The Perfect 4- in- 1 Solution

GPUs by NVIDIA have broken the mold of how graphics card are traditionally utilized by adding features that go beyond gaming and harness the fullprocessing potential of graphics processors. A single NVIDIA GPU is able to process HD media via CUDA, produce high quality 3D graphics in a snap with PhysX APEX, and deliver cutting edge gaming visuals and experience through DirectX and PhysX. NVIDIA GPUs not only let you play games that way they should be played, but lets you build them and enjoy other visual media the way its meant to be.



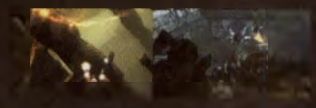
NVIDIA GeForce 9800GT OC

Experience improved raw graphics processing power with a few added features such as CUDA and PhysX for a well rounded graphics card that can go beyond the world of 3D gaming.

- > 112 Stream Processing Cores
- > 1500MHz Processor Speed
- > 660MHz GPU Speed
- > 512MB GDD3 Memory
- > 256-bit Memory Interface
- > 1900MHz Memory Speed

The Definitive Gaming Standard

DirectX computing is the core for many gaming titles, new and old, and is the standard arena where GPUs battle is out to outperform one another and deliver the smoothest and best looking imagery possible. NVIDIA GPUs continually stand out from the crowd by providing some od the most stunning visuals to be produced by GPUs. Working hand in hand with a build-in PhysX processor and with the upcoming Direct3D feature called Tessellation, NVIDIA GPUs will be able to render lush 3D environments up to the minutes detail and recreate real world physics with stunning accuracy and consistency making the leap into the virtual relm almost seamless.

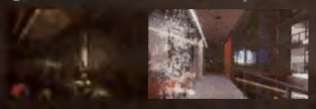


A New World At Your Fingertips PhysX - APEX

Producing high quality 3D media with realistic physics effects is now s simple as toggling a radio button. In the past designers need to constantly defer to programmers to input long lines of code to achieve a specific effect such as a bouncing ball or a piece of furniture toppling over. With PhysX APEX multi platform, scalable dynamics framework and the latest development in PhysX for rendering real world accurate physics effects, designer can be given all the tools they need in a scalable, simple to understand and use interface. The scalability of the technology will take advantage of the available computing power on a given platform. Included with four primary modules with more to b e added in future developments. APEX allows game designer and 3D artists to have greater freedom to stretch their creative legs and come closer to what they envision to be the next big thing to leave the audience and gamers in awe and wonderment.

Redefine Reality

Enjoy a whole new dimension in gaming with a sense of realism comparable to actual real world physics. NVIDIA GPUs are capable of delivering such detailed realism to modern gaming that the boundary between real and imagined is becoming a blur. Duck from flying debris and broken glass, use the environment to outmaneuver opponents and bring all guns to bear from cover as you watch barrels, houses and what not shatter into.a hundred tumbling and burning pieces. Its time to rethink how games are played because what strategies work in the real world may not be so impossible anymore in the virtual realm.

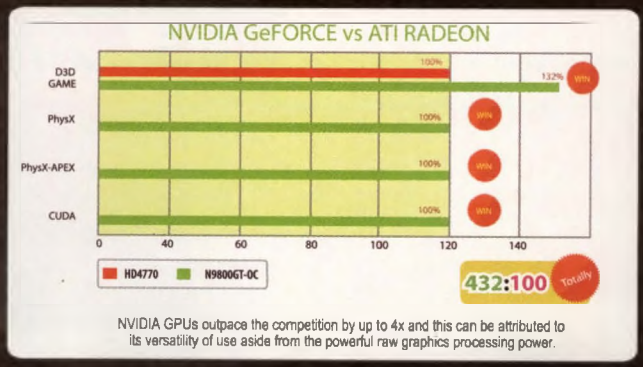


Infinite Perspectives CUDA

Cuda Technology capitalizes on the parallel processing power of NVIDIA GPUs to go beyond the gaming arena and deliver general purpose GPU computing. CUDA compatible applications such as Arcsoft Total Media Theater and Badaboom can take advantage of a CUDA -enabled NVIDIA GPU to encode visual media in dramatically less time than with non NVIDIA equipped system. Aside fromresizing video for portable devices, upscaling from DVD quality media at 480p to full 1080p is also made possible by CUDA.

The NVIDIA Advantage

PhysX is one step closer to a gaming experience that will allow total immersion of the gamer into the gaming environment. With the new Terminator 4 movie and its subsequent game iteration, players will play the role of resistnce leader John Conner in the war against the machine menace in a luch 3D environment of stunning visual imagery and highly accurate physics effects. In order illustrate the advantage NVIDIA graphics cards have in recreating a dynamic and highly detailed environment, a four part test is advised which will include the tradition D3D performance benchmark and high speed parallel computing GPGPU and DirectX Computing. In future generations of display graphics cards, NVIDIA hopes to also include additional roles that GPUs can perform as part of the considerations when determing the quality of the graphics card. This type of full range testing will help gamers and other consumers to understand the profound difference between an NVIDIA GPU over the competition.



NVIDIA GPUs outpace the competition by up to 4x and this can be attributed to its versatility of use aside from the powerful raw graphics processing power.

Toshiba recommends Windows Vista® Business.

intel Centrino vPro inside

Protect. Manage.

Think strength think Toshiba

COMMONWEALTH GAMES AUSTRALIA

PARTNER

With its slim, drop-tested magnesium chassis, Toshiba's Tecra R10 has the perfect balance of agility and power thanks to Intel® Centrino® 2 with vPro™ technology. Light on its feet at just 1.9kg and available with 128GB solid-state technology, this nimble notebook has the poise to make business a pleasure.

Tecra R10

Contact your authorised Toshiba Reseller, call 13 30 70 or visit www.toshibanotebook.com.au

Toshiba is a proud Partner of the 2010 Australian Commonwealth Games Team.

TOSHIBA

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73 howto

PROJECTS, TIPS AND TRICKS

MASTERCLASS

MASTERCLASS NEW SERIES: WEB ANALYTICS

Ash Nallawalla continues his Masterclass focusing on online marketing. This will cover online advertising, web site monetisation, network marketing, blogging for profit, AND MORE!

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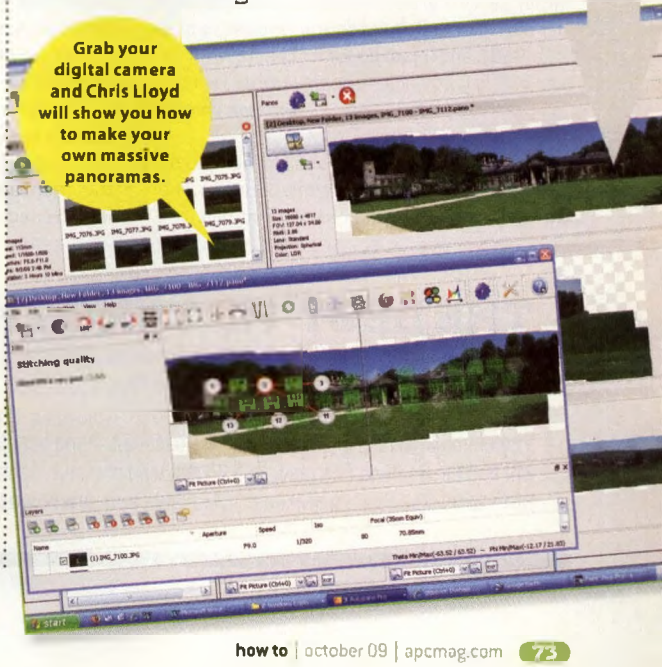

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Experts solve your computing problems

APC, its readers and our partner publications can be one giant helpdesk. If you have a technical problem, chances are one of us can solve it.

HARDWARE

USE WI-FI IN A VIRTUAL ENVIRONMENT

Q I'm using Windows 7 Build 7100 on one of my computers and have Vista running as a virtual machine. The main computer's network connection is shared with the virtual copy of Vista so it's able to get online. What I'd now like to do is use a wireless network adaptor within the virtual environment, but I'm having no luck. I'm using a Belkin adaptor (model number F5D7050), and it just doesn't seem to want to play ball. Is it possible to achieve what I want?

Graham Valentine

A This is technically possible, but you have to jump through a couple of hoops. The wireless adaptor has to be installed under Windows 7, and as it stands there are no specifically written drivers. All is not lost, however. Pay a visit to the Belkin support centre and download the drivers for the version of the adaptor you have. Before running the installation, right click the executable you've downloaded, select 'Properties' and go to the compatibility box. Tick the box to enable compatibility mode and select either Windows XP or Vista as the operating system before clicking OK. Now install the drivers, inserting the adaptor when prompted.

Ensure that your Vista virtual machine is completely powered down — not just hibernated — and edit its settings. Move to the Networking section and either change the 'Adaptor 1' setting so that the Belkin adaptor is used, or indicate that there are two adaptors if a fixed connection is also needed. Click 'OK' and launch virtual Vista before clicking the USB menu and selecting the entry for the newly installed adaptor to attach it. You can then install the driver under Vista and use it.

SOFTWARE

FIND DUPLICATE FILES

Q I'm forever copying files to different directories across different computers and over time I end up with heaps of file duplicates, which take up room on my PC and external hard drives. Can you recommend a program that finds duplicates?

Vishal Singh

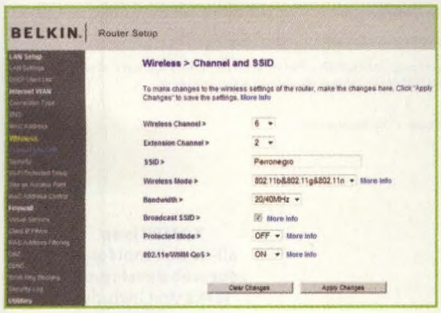
A There are plenty of duplicate file finders, but one we recommend

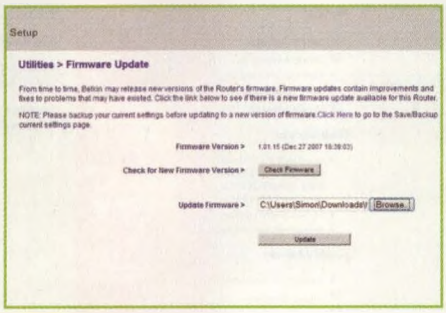
THE BEST TIP WINS THIS!

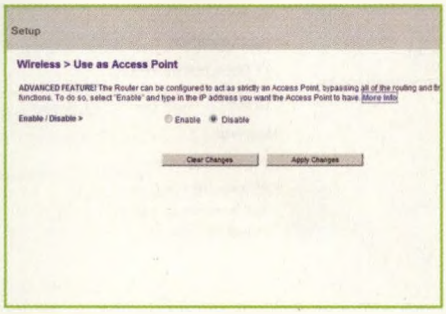
Whether you are a digital photography nut, into designing avatars or need a more intuitive way to mark up documents, the Bamboo Fun tablet from Wacom is for you. Plugged into PCs, Macs or notebooks, the Bamboo Fun uses a pressure-sensitive pen to navigate, draw, write, retouch, and paint. Adobe Photoshop Elements and Corel Painter Essentials come bundled for beginners, while confident users will find the Bamboo Fun unlocks the advanced pressure-sensitive features in their favourite applications. RRP: $299 (Bamboo Fun Medium). Available from **www.wacom.com.au**

3 STEPS HOW TO OPTIMISE YOUR ROUTER'S SETTINGS

Tweak your router's configuration to bolster your wireless network's speed and reliability in case of connection problems or slow speeds.







1 CHANGE THE CHANNEL

Try changing your wireless channel away from the default setting, especially if your neighbours have the same make of router. If there's heavy 802.11b traffic in the area, or you suffer from a lot of dropouts, you can try turning to the Protected mode.

2 UPDATE THE FIRMWARE

If you still have problems, it's worth looking for new firmware updates from your router manufacturer, which will add new features and increase stability. In many cases you can add an open source firmware component that will radically improve your router's performance.

3 BOOST SIGNAL STRENGTH

If your problem is more to do with signal strength, then you'll need to boost the power. Many routers can be used as wireless repeaters by being put in Access Point mode, so if you need more signal power, get a second router and extend your network range.

is by an Aussie company, Auslogics, which makes PC optimisation utilities. Its "Auslogics Duplicate File Finder" is free and compares files via MD5 checksums, so it will identify the same files even if they are under different names. Run it and you'll be amazed how many files are doubled up on an average PC. It works on versions of Windows from XP to Windows 7. Download it at **tinyurl.com/m95stg**.

INTERNET

EASY FTP

Q While I understand the benefits of using an FTP client, sometimes I just need to quickly upload an image to my web space. Is there a way to access an FTP account without the need to constantly enter my username and password?

Kevin Reid

A You can create a shortcut in Vista to achieve what you're looking to do. Open the Computer folder, right-click an empty space and select the option to 'Add a Network Location'. Click 'Next' followed by 'Next' and then type the address of your FTP server, including your username and password using the following format: **ftp://username:password@ftp.myserver.com**.

You now have the option of navigating to your FTP server from within Explorer. The shortcut to the FTP server can be dragged from the Network Locations section of Computer to somewhere more easily accessible such as the desktop.

WINDOWS

SCROLLWHEEL FUNCTIONS

Q With most files, the scrollwheel of my Microsoft mouse can be used to zip through documents. However, in Excel 2007, using the scrollwheel adjusts the zoom level of the current spreadsheet. Why is Excel acting differently?

James Westhead

A There's an option in Excel that controls whether the mouse wheel is used for scrolling or zooming. Click the 'Office' button, click 'Excel Options' and move to the Advanced section. Untick the box labelled 'Zoom on roll with IntelliMouse' and click 'OK.

VISTA

UNINSTALLATION CONFIRMATION

Q The last time I uninstalled a program via Vista's Programs and Features Control Panel, I accidentally ticked the box to hide the confirmation box dialog that's displayed. Is there any way to get this back? It's not a major problem, but I'd like the extra level of security to be restored.

Matthew McPherson

A A quick Registry edit is all that's required. Open the Start menu, type regedit and launch the editor from the Start menu. Navigate to 'HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Explorer\DontShowMeThisDialogAgain' and delete the key named '{948e51fb-0a48-44f0-86ac-33c36def540c}'.

That'll do the job nicely.

WINDOWS

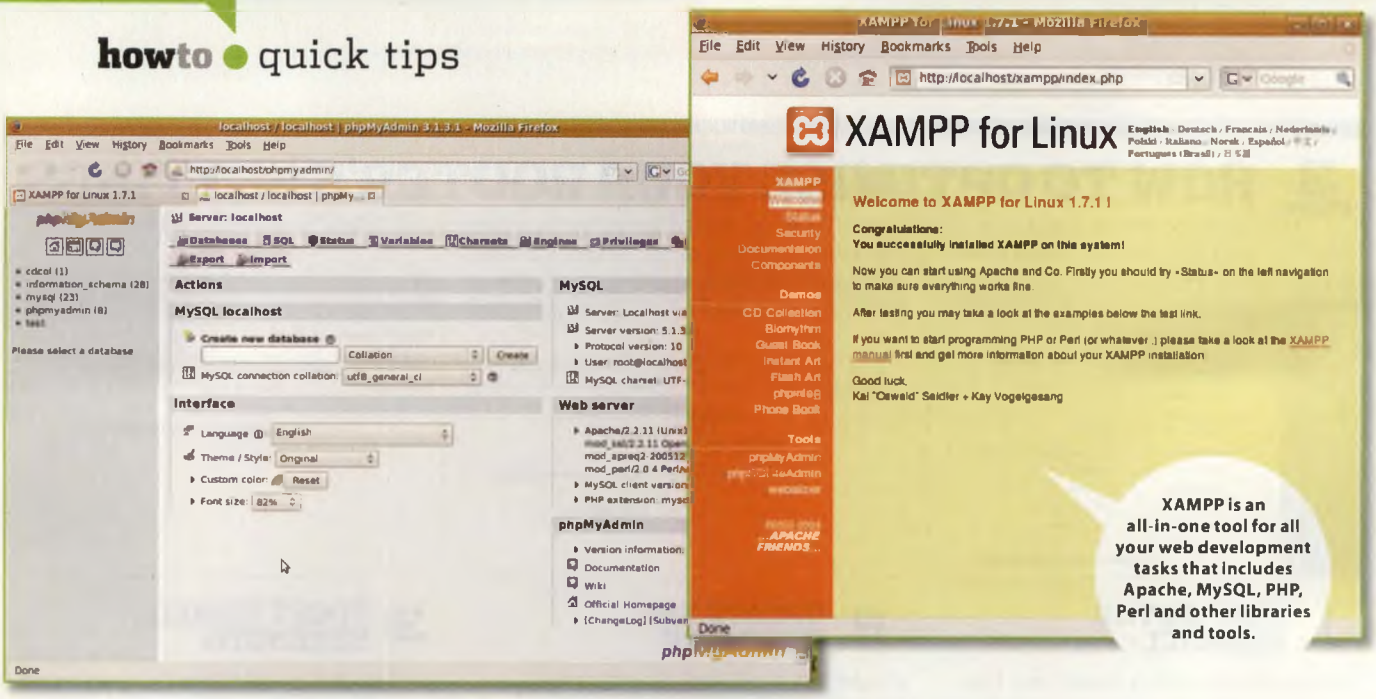
SLOTS GONE

Q Since installing the evaluation version of Windows 7, the slots in my memory card reader are not displayed in the Computer folder. However, if I insert a card from my digital camera, I'm able to browse through the contents. I've tried searching for updated drivers and have made use of Windows updates, but I have had no joy. Why are my card slots invisible?

John Goodenough

A This is just one of the ways that Windows 7 works differently from previous versions of the operating system, and it doesn't mean that there is anything wrong with your card reader. By default, Windows 7 will hide the icons for drives if they are empty.

If you would prefer to see the full complement of drive letters, this can be done with a change of settings. Open an Explorer window, click the 'Organize' toolbar button and select 'Folder and search options'. Move to the View tab and untick the box labelled 'Hide empty drives in the Computer folder' before clicking 'OK'.


XAMPP for Linux
Welcome to XAMPP for Linux 1.7.1 !
XAMPP is an all-in-one tool for all your web development tasks that includes Apache, MySQL, PHP, Perl and other libraries and tools.

WINDOWS

INSTALLATION CLEANER

Q What really annoys me is that if something goes wrong during a software install the program is only partly installed, doesn't work and leaves shreds everywhere. Windows seems to have no way of cleaning up the mess. How does one go about removing failed application installation detritus from the system?

Ya Huang

A Microsoft is aware of this and has produced a utility called the Windows Installer Cleanup Utility, which is designed to hunt down and remove the installation files of partly installed or corrupted programs. It doesn't remove the program itself, just the installation files, which when corrupted are the cause of further installation or uninstallation issues. The program now works with 32-bit and 64-bit systems. Download it from **tinyurl.com/45x45** and run it as an administrator.

TIP: WINDOWS

FREE BURNING APP

Nero is the disc burning software favoured by geeks for its powerful capabilities — but in recent years it's become bloated and expensive. Perhaps recognising the increasing alienation from its traditional users and the rising popularity of light alternatives like ImgBurn, Nero is now making a free "Nero Free Version" available. This still has Nero's hardcore disc burning and copying functionality but without many of the premium modules. Download it from **tinyurl.com/kt73yp**

WINDOWS

HIDE FILES

Q I have some files that I need to hide. Is there any way of doing it simply without stuffing around with encryption keys?

Georgia Nielsen

A A simple trick is to use steganography, in which no-one else suspects the file is hidden, as opposed to encrypting a file, which telegraphs your intention to keep it secret if someone notices the encrypted file. A solution that's really simple to use is FireSteg, a Firefox plug-in. It installs as an optional sidebar and lets you browse your computer for the files to be hidden as well as the "cover" images to insert the files into. Hit the Hide button, and it hides the contents into the image or images and saves the now bigger images to where you decide.

WEB DESIGN

DEVELOP WEB SITES ON YOUR PC

Q I'm developing a web project as part of my undergraduate course in computer science. I've heard good things about the LAMP foundation (Linux, Apache MySQL, PHP) for this kind of work, but I have no experience setting it up. Any pointers?

[Name withheld]

A The best approach is to grab the latest XAMPP package. This is for Linux, but there are similar packages for Windows. XAMPP is an all-in-one bundle that includes the Apache, MySQL, PHP, Perl and PEAR PHP reusable components. It also includes phpMyAdmin, the SQLite database, a graphical MySQL database management tool and lots of other libraries and tools.

To install XAMPP, just extract it under /opt with: sudo tar xvf xampp-linux-1.7.1.tar.gz -C / opt. That's all the installation there is.

Now turn on the ignition and start XAMPP with: /opt/lampp/ lampp start. You now have a fully functional Apache webserver hooked up with MySQL and PHP and ready to serve.

The XAMPP package includes several sample programs that can be used to check the installation. Since they're available under the GPL licence, you should also look at their code to get an idea on how all the various components work together. For example, there's the very simple CD Collection program that's written in PHP, stores data in MySQL and uses the PDF class to display the collection in a PDF.

To run the sample programs, launch your web browser, and point it to **http://localhost**. This will bring up the XAMPP start page. Click on 'Components' to see a list of all the tools and libraries available under XAMPP, and on 'Status' to see all the active ones. The sample programs are listed under 'Demos'. Each sample program also has a 'Show source code' link. Now it's time to get on with your web development work.

When you've completed it to your satisfaction, you can upload your project files under the Apache DocumenRoot directory, which under our XAMPP installation is '/opt/lampp/htdocs/'. XAMPP is configured to give you full access to all the components, and you won't need to alter any settings. Configuration files for Apache, PHP, MySQL and other sections are kept under '/opt/lampp/etc'.

XAMPP really is ideal for a new developer, as it encapsulates all the complexity involved in setting up a web development box behind an easy-to-install and manage package, while still giving you the freedom to tweak anything that you want to change. Best of luck with your project!

TIP

TAKE YOUR VIDEOS WITH YOU

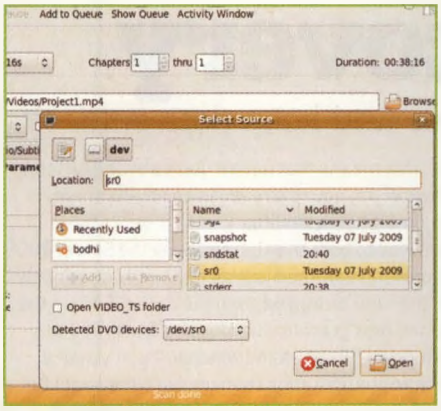
The majority of us carry a multimedia device such as a business phone, a Sony PSP or a fancy MP3 player in our pockets. How can you get video from a high-resolution source like your video camera onto a device with a tiny screen?

While you can copy your favourite MP3s directly into your handheld device, video takes some effort. For videos to play properly, they have to be transcoded into an appropriate format using specialist tools like Handbrake. Handbrake packs in a lot of functionality behind the easy-to-use GUI. It can handle multiple audio tracks if your video file has them, and it's not limited to using MPEG-2 as source either — you can point it to any type of video and it'll work its magic on that. The program uses the latest, improved versions of the popular H.264 encoding library to produce better video quality. Best of all, it has presets for popular devices, such as the iPod and PSP, which makes the process of converting videos a whole lot easier and quicker. You can grab a copy from **www.handbrake.fr**.

6 STEPS

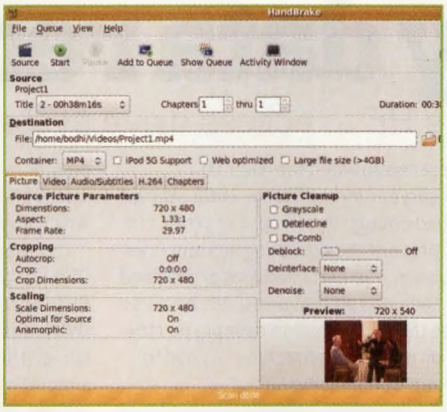
MAKE YOUR VIDEOS PORTABLE

Handbrake will make all sorts of videos playable on all sorts of portable devices. We're showing the Linux version, but Handbrake works the same on Windows and Mac OS X.



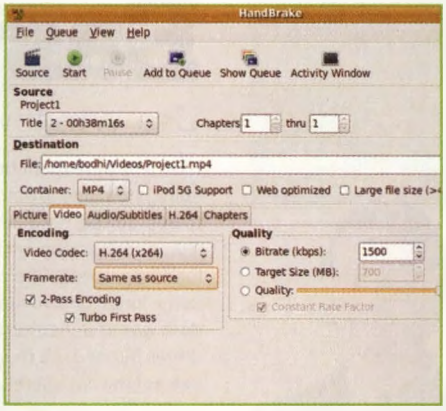
1 SELECT A VIDEO SOURCE

Begin by pointing Handbrake to the video you wish to convert. If it's on a DVD, pop the disc into the drive. Alternatively, go to 'File > Source' to select a video stored on your hard drive.



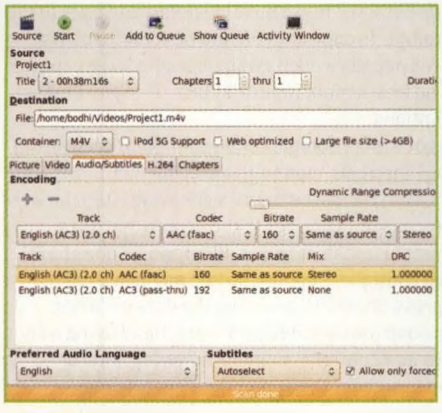
2 USE A PRESET

You can choose to convert your source into a particular format by selecting one of the presets. Handbrake includes presets for several common devices, including iPod, iPhone, PSP and more.



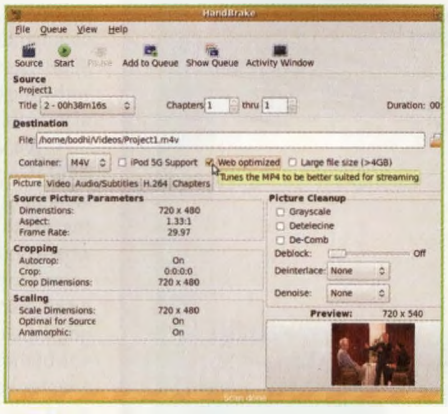
3 CHOOSE A CODEC

If you aren't using a preset, you'll have to pick a codec. Your choice will be between the XviD MPEG-4 codec library or the H.264 codec. If you aren't sure which one to use, go with the latter.



4 TWEAK THE AUDIO SETTINGS

In addition to the high-quality AAC codec, you can encode the audio either with the LAME MP3 encoder or as Ogg Vorbis. If you've got multiple tracks, you'll need to encode them all.



5 PICK A CONTAINER

The container is the extension that goes at the end of your converted video file. Choose the container that is supported by the device you want to play the video on.

6 START THE PROCESS

Finally, select a preview picture. This can be any frame from the source. Once you've added all the videos, add the task to the queue and click the 'Start' button to begin encoding.

78 insider tips

HOW THE PROFESSIONALS DO IT

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WINDOWS VIEW

Easy data recovery

Use Windows PE to access drive systems and keep data safe.

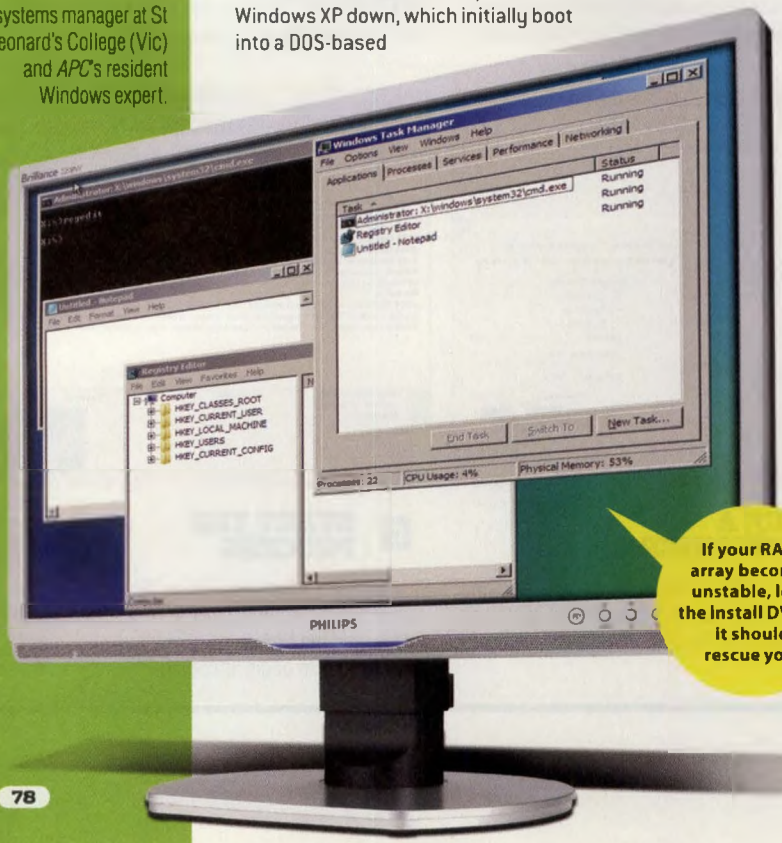
APC EXPERT

JAMES BANNAN

James Bannan is a systems manager at St Leonard's College (Vic) and *APC*'s resident Windows expert.

I had a nasty experience recently when the RAID 10 subsystem on my home server running Server 2008 started to destabilise. It wasn't bad enough to corrupt the array, but it was serious enough to prevent the operating system from loading properly. The problem was that I had a lot of data and some important virtual machines on that array, but because data was spanned across the disks I couldn't simply pull the drives out and fire them up on a stable machine — I had to extract the data safely from that specific array.

The OS was completely unstable in normal mode and Safe Mode, but fortunately the install DVD came to the rescue. The install media for Windows Vista and Server 2008 (and Windows 7/Server 2008 R2) loads into Windows PE, which uses exactly the same kernel and driver model as the full version of Windows, unlike previous builds from Windows XP down, which initially boot into a DOS-based environment. This means that before you've even started to install Windows Vista, you're already in an environment which gives you a lot of flexibility.



If your RAID array becomes unstable, load the Install DVD — it should rescue you.

So the plan was to boot the system using the Server 2008 DVD (Vista would have worked just as well) and use Windows PE to access the RAID array and copy the data off. When the DVD loads up the first graphical window, hit Shift+F10 to launch the Windows PE command window. If you've got a simple hard drive configuration then you've already got full access to the disks. To see what drive letters have been assigned to which partition, type in 'DISKPART' in the command window to enter the partition editor, and then type in 'LIST VOLUME'.

Windows PE is a plug'n'play environment, so if you want to copy data off to an external drive you don't need to reboot — just plug the device in and wait a few seconds for it to initialise. Type in 'LIST VOLUME' again within DiskPart and the drive should appear — Windows PE can read FAT32 or NTFS partitions. Type in 'EXIT' to get out of DiskPart and back to the command prompt. To copy data off, the best tool to use is XCOPY, as it will happily work its way through a large copy job with little or no interaction. Type in 'XCOPY /?' to get a full list of available options.

If you've got a more complex drive configuration (like my RAID 10 array) then you need to go a step further. Instead of launching the command window straight away, step through the install process until you get to the screen that asks where you want to install Windows. Windows PE does have some storage controller support, so you might see the right disks. If so, press Shift+F10 and copy the data off. If not, you'll need to load the right device drivers. Head to the web site of the storage controller manufacturer (eg. Intel or Adaptec) and search for the appropriate Vista drivers — make sure you get the right platform, 32-bit or 64-bit.

Extract the drivers to an external drive or USB key, then click Load Driver and Browse for the drivers. The drivers will load and the disk should appear — at this point do *not* hit Next or you'll initiate an installation. Just hit Shift+F10 to launch the command window and the disks will now be accessible.

After some tentativeness I was able to use exactly this method to move all my data to safety. Phew!

64-bit Chromium on *www.apcmag.com*.

LINUX WINDOW

Chromium

Feeling left out of the Chrome loop because you're running Linux? You don't have to be.

APC EXPERT

ASHTON MILLS

Editor of the Linux Pocketbooks series, and now with CHOICE magazine, Ashton has been a tech journo for over 13 years, including five years with *APC*.

With the browser market dominated by Internet Explorer and Firefox, Google's launch of its Chrome browser in September 2008 was seen as a shot across the bows for the browser behemoths. It's not that it's just another browser on the scene — the excellent Opera is another high-profile alternative — it's because Google is doing it. All the academic and financial muscle behind the company means it's not going to be a product that sucks. So far the betas have both impressed and let down though. And, assuming it doesn't remain in perpetual beta-hood, as its email service seems to be, the ongoing development of Chrome may well see it rise as a serious competitor to IE and Firefox.

Despite its open source leanings and activities (such as Google's Summer of Code, which sponsors students to write for open source projects), Chrome isn't available for the Linux platform. At least not officially. The standard stable release is available only for Windows, but a development version through source code by the name of Chromium, from which Chrome is actually built, is available for Linux under the caveat that it is a development release.

However, perhaps because of its open source nature, where both the OS and all the apps that ship with it can be compiled for 64-bit, Google unofficially launched the first 64-bit version of Chrome on Linux only. Windows and Mac will have to wait, for a change. While still under the Chromium development moniker, it's none the less Chrome for Linux. If you're running 64-bit Linux and interested in taking it for a spin, you can, as a development release, compile it yourself or opt for the easy-install method and grab a pre-compiled binary for Ubuntu from the Chromium PPA archive at **http://tinyurl.com/86cezo**.

Simply add 'deb http://ppa.launchpad.net/chromium-daily/ppa/ubuntu jaunty main' to your sources through 'System > Administration > Software Sources > Third Party Software', click to re-load your local cache, start a Terminal from 'Applications > Terminal', and then install Chromium with 'sudo apt-get install chromium-browser'.

To launch Chromium, run 'chromium-browser' from the command line. It will nicely ask if you wish to import settings, bookmarks, and so on from Firefox, which is a good idea if you want to see how it compares to Firefox loading your favourite sites.

As the about page for the browser states, two core features currently under development are plug-in support (such as for Flash) and printing. However, early reports state that plug-in support is quite stable, and although there is no installer with Flash that supports Chrome (for obvious reasons) you can enable Flash support by simply linking from Chrome's plug-in directory to Flash:

```
sudo ln -s /usr/lib/flashplugin-installer/libflashplayer.so/usr/lib/chromium-browser/plugins/
```

Then start the browser with the '--enable-plugins' flag. If you want to combine 64-bit Chrome with Adobe's 64-bit Flash for Linux, also in development (to give you that extra cutting-edge feel) head to **http://labs.adobe.com/downloads/flashplayer10.html** and download the 64-bit Flash plug-in for Linux. It contains the Flash player library, libflashplayer.so, which you can simply copy to /usr/lib/chromium-browser/plugins. This trick also works for Firefox, as well — just copy the library to ~/.mozilla/plugins. If the plug-ins directory doesn't exist, make it first. It's a good idea to also uninstall any currently installed Flash player packages to avoid conflicts.

And how can you quickly test 64-bit Flash is working in Firefox or Chromium? Just head to YouTube! EDGE

APC EXPERT

MITCHELL ROSS

Mitchell is a tech support gun who has worked in support centres at BigPond and iiNet as well as running his own business before joining a computer and network setup and repair service, Gizmo, at the start of 2008. He is currently managing the Sydney-based repair facility.

HARDWARE

Unknown devices

If you get stuck trying to identify an Unknown Device in Windows, **Mitchell Ross**, a PC technician, explains what to do.

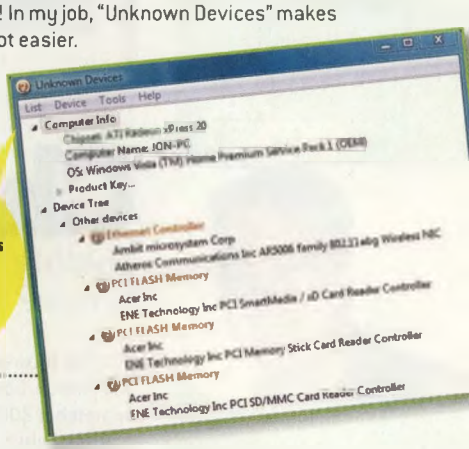
If you have ever tried to rebuild or repair a Windows PC or notebook, and no longer have the OEM device driver disc available, you've probably experienced the frustration of trying to identify a long list of dreaded unknown devices.

There are a few freeware applications around that can help you, but my favourite is "Unknown Devices" from Halfdone Development (**halfdone.com**). This is a small portable utility that, just as the name suggests, identifies the so-called Unknown Devices that appear in the Windows Device Manager. The tool can be downloaded and even stored on a flash drive for fast access and runs without the need to be installed, making it a joy to use.

This tool helps identify the Unknown Device by listing the manufacturer, device name and model name/number, which you can then use to locate and download the appropriate device driver. It'll even launch an internet search for you when you highlight the device from the list and press F3 on your keyboard.

When you find and download your missing drivers, try to play it safe. Before you start installing software, create a system restore point. Even though Device Manager allows you to roll back drivers, system restore points create a point in time that you can go back to months later, regardless of how many drivers you have installed in the meantime. Create a download folder with the relevant device title to save your new drivers to, and of course, virus-scan any software you get from the internet.

If you are downloading drivers for multiple devices, install and test them one at a time before proceeding to the next device. Once you have all your drivers installed and tested, do yourself a favour and create a clearly labelled back up of them! In my job, "Unknown Devices" makes my life a whole lot easier.



The Unknown Devices utility names the orphaned devices.

APC EXPERT

PETER DOCKRILL

Peter Dockrill is *APC*'s DVD Editor. He also edits the Chip Chat column, in addition to writing occasional reviews and sub-editing the magazine. He formerly edited *APC*'s Watchdog section, and he contributes as a technology writer to *Money Magazine*.

COVER DVD

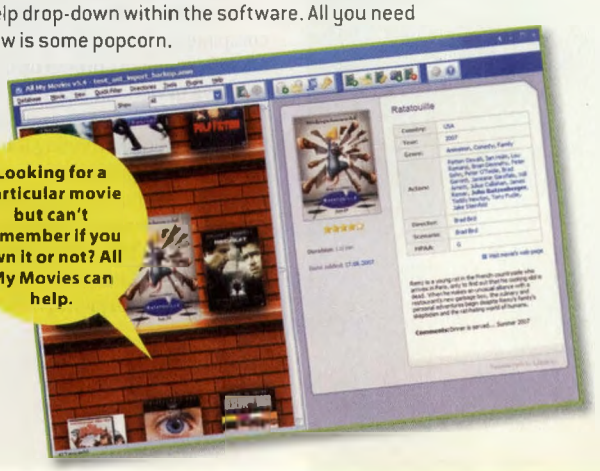
Organise your movies

Our full-version cover disc software, All My Movies, helps you keep track of all your movies and DVDs the easy way.

Movies. Everyone loves watching them, and, these days, thanks to the extensive catalogues of DVDs and Blu-rays available, it's possible to get a pretty darn respectable personal cinema collection together. The only problem (well, apart from finding the time to watch them!) is finding the time to organise your movie collection. What DVDs have you got? What Blu-rays? (And what old VHS lurking in the attic?)

Sure, you could manually keep a list of titles written down, or better yet upgrade to a Word document, but neither of these are particularly elegant solutions. What you really want is a dedicated movie organiser database program to catalogue and present your collection. And wouldn't it be great if it could automatically populate each entry with information about the movie, who starred in it and directed it, what year it was made, and provide images as well? Cue: Bolide's 'All My Movies', worth US$45, and available for free on this month's *APC* cover disc. All My Movies does all this and more, and it's a cinch to use.

First, install the program from the DVD and launch it. To create a new database, select Database > New. To add a movie, hit Movie > Add, then type in the name of the movie and hit the Lookup button to populate the entry with information from the Internet Movie Database (IMDb). Congratulations, you've officially started organising your movie collection. Spend some time playing around with the program; you'll find there's lots more to discover. For further instructions, head on over to **www.bolidesoft.com** to check out the All My Movies online manual, or look in the Help drop-down within the software. All you need now is some popcorn.



Looking for a particular movie but can't remember if you own it or not? All My Movies can help.

HARDWARE

Upgrade your PS3 hard drive in 5 steps

Don't make do with a measly 40GB drive in your PS3: here's how to upgrade in just ten minutes.

APC EXPERT

CHRISTOPHER ZAMMIT

As well as editing and writing the Downtime section, doing camera reviews and creating Exploding Tech, Chris works as *APC*'s Art Director. He also regularly contributes games reviews for the PS3.

What about SSD drives?

SSD drives like Intel's X-25 will work in this upgrade but the $600 cost of an 80GB model makes their use too expensive.

Even if you have a 160GB PlayStation, there never seems to be enough storage space. With the wide variety of downloads and storage possibilities for movies, music, photos, game demos and the necessity of installing game data and saves, the supplied hard drives seem woefully inadequate for the task. It comes as a surprise that the average console has only 40GB of internal storage, which, in our case, lasted us only one year. With the hard drive completely full and our newest review title rendered unplayable due to there being no space left to load it, we were left with no choice but to upgrade. It may sound daunting, but it's easier than you would think.

The first step is to grab yourself a replacement drive. The PS3 is compatible with any 2.5in SATA notebook hard disk, so it is up to you which one you get. Just make sure that it is a 5,400rpm drive for the best results.

As far as storage capacity goes, the bigger the better. You can go all the way up to 1TB if you've got the cash, but we suggest at least 320GB if you're going to the trouble of upgrading. After shopping around online we settled on a 500GB Western Digital Scorpio Blue drive, which we picked up for $135. With your new drive in hand you're ready to begin.

1 DO A FULL BACKUP OF YOUR PS3

It is very important to back up all your data on your PS3 to an external hard drive or you will lose all your game saves, music, videos, demos and downloads when you install your new drive.

To do this, first plug in an external drive (or USB key) into an available USB port. The removable storage device must use the FAT32 file system in order to be compatible. Once your backup device is connected, go to the Settings menu , then down to System settings and then click on the Backup Utility. Simply follow the prompts and the backup will begin. Depending on how large your original drive is, this could take a couple of hours.

2 REMOVE THE OLD DRIVE

Once the backup is complete and all your data is safely stored away, you can begin the easiest part — swapping out the drives. At the base of the PS3 is a small panel that pops off with a gentle prod from a screwdriver. Inside you'll see the drive tray, which is simply held in by one blue screw. Remove the screw with a Philips head screwdriver and the drive tray will slide out to the right.

3 MOUNT NEW DRIVE

Once the tray is out, it is a simple matter to remove the four screws that hold the drive to the tray. Before separating the drive from the tray, make sure to look at which way it is attached. It's very important that the new drive is attached to the tray facing the right direction.

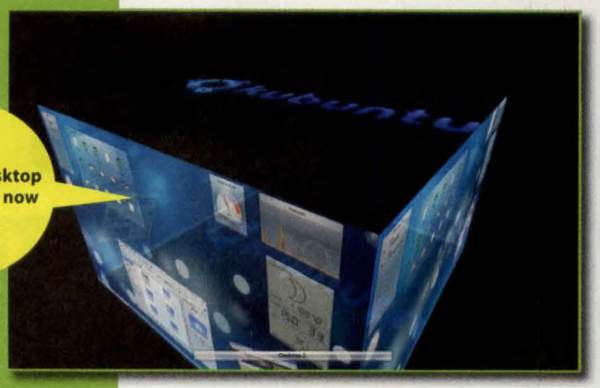
4 ATTACH AND INSERT NEW DRIVE

Once again, make sure that the new drive is facing the same way as the old one (connections to the left) when you place the drive back onto the tray. With all four screws replaced, simply slide the tray back into the drive bay and push it firmly to the left until you feel it wedge into its socket. Lastly, reinsert the blue screw to hold the drive in place, replace the drive cover panel and your done.

5 RESTORE YOUR BACKUP

Turn on your PS3. The unit will recognise that a new drive has been installed and will want to format it. Say yes to this. Once the drive is formatted, go to the Backup Utility used earlier and restore your data. Once done you'll have a PS3 with a lot more space to store your gaming goodies. apc

Out with the old and in with the new: It's easy for anyone to turn their PS3 into a storage-heavy media hub.



The popular desktop cube effect, now in KDE.

An alternative theme and background, downloaded on the fly by KDE, and more desktop object widgets.

APC EXPERT

ASHTON MILLS

Ashton has been using Linux since Slackware came on floppies, and before that he was one of the three people in the world who used OS/2 (and loved it). Always ready to make the most of his PCs, he is constantly playing with Linux distributions and compiling the latest kernel. This is his idea of fun, and why we get him to write for *you*.

OPEN SOURCE CHALLENGE

Return to KDE

If the admittedly-not-production-ready KDE 4.0 scared you away, the 4.3 release invites you back with open arms.

Recently we took a look at the new KDE 4.0 release that promised to re-define the desktop paradigm, at least a little bit, and give Vista a run for its money. And it did just that. But it also had bugs, performance issues and missing features that KDE 3.X users had taken for granted. By the developers' own admission, the initial release of KDE 4.0 was not production-ready, and this was reflected in the number of users who tried out the next big thing only to walk away from it. But like anything worth building, doing something well takes time. Recently, KDE 4.3 was released, so I thought it was about time to check in and see where it's at and how far it has come. Additionally, this is a great opportunity to show you how to set up a dual-desktop system with both KDE and GNOME installed for Ubuntu, allowing you to switch between both easily.

INSTALLING KDE 4.3

As a brand-spanking-new release, KDE 4.3 won't have made it to any but the most cutting-edge of distributions at the time of writing. For Ubuntu especially, you won't see KDE 4.3 bundled into Kubuntu until 9.10. But that doesn't mean you can't install it on Ubuntu now. The first step is to add the Kubuntu repositories to your software sources. Click 'System > Administration > Software Sources > Third Party Software' and then click Add. Enter 'deb http://ppa.launchpad.net/kubuntu-ppa/backports/ubuntu jaunty main' and then reload your local cache.

The easiest way to then install and pull in all the correct packages is to literally install the Kubuntu desktop using its meta-package from the command line, like so:

```
sudo apt-get install kubuntu-desktop
```

As it's a full desktop, expect to be prompted to download close to 300MB in packages, which will expand to over 700MB, so make sure you have plenty of space set aside first. When KDM, the KDE Display Manager, is installed you will also be prompted to choose which display manager you want to use. If you choose KDM and later want to switch back, I'll show you how below. Once installed you will have KDE 4.3 alongside your GNOME 2.26 desktop, and it will already be available for you when you log in. Just log out of your session to return to the GDM login screen, enter your username and password, but before pressing enter click 'Options > Select Session' and tick KDE.

CLEANER INTEGRATION

Because you're installing the full Kubuntu desktop, there are a few extra steps you can do to make a cleaner integration with your Ubuntu desktop.

If you notice your bootsplash graphic has changed to Kubuntu and want to change it, you can restore it to Ubuntu: click 'Applications > Add/Remove' and, with 'Show' set to 'All available applications', search for 'Startup'. Then select and install Startup Manager.

Launch Startup Manager from 'System > Administration > Startup Manager', then under Appearance set the 'Usplash theme' to Ubuntu. Startup Manager is essentially a graphical configuration program for the GRUB boot loader, and you'll notice a range of other options you can tweak.

If you want to restore your display manager to GDM from KDM, simply open a Terminal and run:

```
sudo dpkg-reconfigure gdm
```

You can also use 'kdm' and easily switch between them by simply re-configuring each time.

Finally, because you have two desktops installed sharing your one username, you may find that all of the default KDE applications now show up in the GNOME menus and vice-versa. It's handy having them here — you can run GNOME programs on KDE and KDE programs on GNOME — but you might not necessarily want them grouped together. That's where two nifty programs come in handy.

Head to **www.gtk-apps.org** and search on 'gnome menu extended', then download the Debian package to your desktop. To install it, simply double-click. It will automatically re-order all KDE applications under a 'KDE'

The default Air theme with file manager and widgets, any of which can be rotated.
New content can be downloaded on the fly by KDE.
Plasma Workspace Add-On Installer

menu item. To do the same for GNOME applications in KDE, run the ancillary package by heading to **www.kde-apps.org** and search on 'k menu gnome', download the Debian package, and click to install and run it.

Congratulations! You know have both KDE and GNOME desktops installed and integrated cleanly together.

WHAT'S NEW?

According to the KDE developer community, thousands of bugs have been squashed and thousands of feature requests implemented since the release of KDE 4.0. Many of the visual improvements are in the new KWin window manager and Plasma desktop shell that supports the KDE 4.0 interface, speeding up rendering and fixing bugs that plagued the earlier releases.

And, applications and toying with desktop paradigms aside, I have to agree after using the 4.3 desktop for a few days that the tweaks and improvements to the interface have come a long way. In fact, while GNOME has a very reliable and consistent style that we've come to know and love with Ubuntu, KDE 4.3 feels closer to Windows 7 in terms of visual polish and effects. It's strange to say, especially as a GNOME fan, but after playing with KDE 4.3, GNOME now feels like it's behind the times.

Helping it along is a new default theme 'Air', and it looks beautiful. While I'm personally still not too fond of the Oxygen widget set (the theme that details elements like buttons), Air is a great complement to KDE and really shows off how pretty a Linux desktop can be.

Many of the 3D accelerated functions that GNOME users with Compiz have taken for granted — such as transparency effects, window wobbles, cube desktops and shadowing highlights — some of which were notably absent in the beginning, are now all there as well with KDE 4.3. More than this, KDE seems to implement them better: the transparency is slick and fast and fits seamlessly with the desktop, complementing and not overshadowing it, while effects like wobbly windows (disabled by default) are subtle and not over the top. The implementation of cube is a little different in terms of how the cube is controlled, but it's just as visually sexy as the GNOME and Compiz.

There are many more widgets present now too, all of which reflect a polish again reminiscent of Windows with its sidebar (Windows 7's detachable and floating widgets themselves seem inspired by KDE 4.0, which were floating from the start).

Unlike GNOME, KDE makes it easy to get new content for the desktop: in the background setting features you can fetch new backgrounds directly from the net from **kde-look.org**, new themes can be fetched directly from the theme manager, and new widgets can be fetched from the widget dialog. While there is a large range of backgrounds and themes, there isn't a large widget collection yet — although you know you've achieved widget nirvana when there's one to monitor the status of realm servers for World of Warcraft.

One of the key features of KDE 4 is that the majority of the desktop is treated as objects, and so while clicking on the clock can bring up a calendar, you can then drag that calendar anywhere on the desktop as a widget. Once you get the hang of interacting with elements of your desktop this way, it becomes a very clean and flexible environment.

My only complaint is KDE's typical over-abundance of settings for the desktop and most applications. Frequently used options take longer to find while you navigate past all the options you rarely, or never, use. GNOME is somewhat too far in the opposite direction — its simplicity is nice but is oversimplified where more flexibility would be desired. A happy medium between the two would be a perfect desktop.

Even with brief usage, and as a happy GNOME user, I have to say KDE 4.3 has impressed me; enough so, that I think when Ubuntu 9.10 arrives I'll be installing the Kubuntu variant and giving it a whirl as my primary desktop. Switching from GNOME to KDE after all these years should be an interesting journey in itself!

DO THIS... REMOVING KDE

If you've had a play and decided KDE isn't for you, you can uninstall it from your Ubuntu desktop with:

```
sudo apt-get autoremove
kubuntu-desktop --purge
```

IN THIS ISSUE

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GEOTAGGING

Geotag your photos: part 1

Geotagging is adding a new dimension to photography. **David Braue** shows how to sort your photos by where they were shot.

WHAT YOU'LL NEED

SMARTPHONE
Smartphone with a geotagging-enabled camera, like an iPhone, BlackBerry or HTC Dream or Magic.

GPS
Or a GPS add-on that plugs into a digital camera's hotshoe.

One of the beautiful things about digital cameras is that they automatically stamp images with the date and time they were taken — providing a chronological record that's invaluable in keeping your pictures organised. But what if you could also tag photos with information on exactly *where* they were taken? Geotagging plays on the world's newfound obsession with geography by making it as easy to sort photos by the place they were taken as it has always been to sort them by date.

Users of photo sharing site Flickr have geotagged more than 79 million photos at **www.flickr.com/map/**, and new photo-management software like Google Picasa and Apple iPhoto '09 have built-in geotagging support, so tagged photos automatically show up in their geographical context.

It all goes back to GPS, a US Army-designed technology that has become the world standard for location tracking. GPS uses a specially designed chipset and antenna (SIRF Technology's popular SiRFstarIII is currently the gold standard) to measure signals from a constellation of 24 GPS satellites orbiting the earth at fixed points in space. Your location can be triangulated to within a metre or less using readings from as few as three satellites, although accuracy increases with stronger signals. With four or more signals, your altitude can also be calculated.

Most people's first exposure to GPS is through in-car navigators, but the addition of GPS capabilities to iPhones, BlackBerrys, HTC's Dream and Magic, and a host of other smartphones, has put it within everybody's reach.

However, GPS has still not penetrated very far into digital cameras, the very market that would seem to benefit most from it. While new technologies like face detection and image stabilisation have become commonplace, geotagging is still only available in a handful of digital cameras — such as Ricoh's 500SE and Nikon's P6000.

There are very good reasons for this. The first is that even the best GPS units can take 30 seconds or more to get a fix on the satellites' signal. This delay, called Time To First Fix (TTFF), is only an issue when a GPS tracker is first turned on; subsequent measurements are almost instantaneous.

GPS sensing is also extremely battery-intensive, and sensors can drain three conventional batteries in six hours' usage. Battery life is extended if the sensor is shut off between pictures, but few users are going to see much value in a GPS solution that requires 30 to 45 seconds of waiting after each picture. For this reason, built-in GPS still involves too many compromises for widespread use.

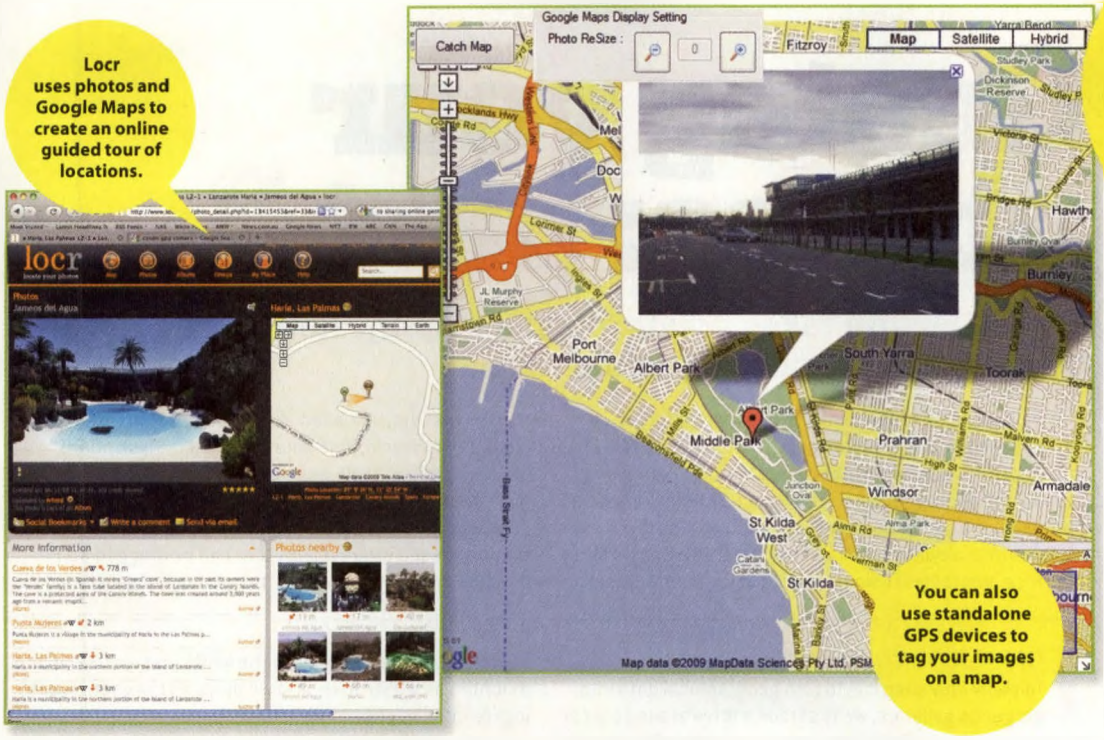
STANDALONE UNITS

That doesn't mean there isn't an alternative, however: digital SLR users can choose from GPS add-ons like the Jobo Photo GPS Geo Tagging Flash Shoe, Nikon GP-1, or Promote Systems GPS Receiver, which plug into the DSLR's hot shoe and feed GPS details when a picture is taken. This approach conserves battery life and allows the GPS unit to stay on at all times.

Users of cameras without hotshoes have adopted a different approach by using standalone GPS units such as Sony's GPS-CS1, GiSTEQ's PhotoTrackr and PhotoTrackr Lite DPL700, Amod's AGL3080, GlobalSat's DG-100 and Royaltek's RGM-3800.

These devices all work in a similar way: using built-in GPS receivers, they record your position at regular intervals and assemble a log file in one of several global-standard formats. Each position reading is timestamped using purpose-built software, the log files are fed into a computer and each photo is geotagged by matching its timestamp with the closest geographical position to that time in the log file. The geotagging process writes the photo's longitude, latitude, altitude and speed information inside the file as standard EXIF data that stays with the picture permanently.

Some of these units connect to computers via USB, mounting either as a standard USB drive or require proprietary


Locr uses photos and Google Maps to create an online guided tour of locations.
Google Maps Display Setting
Photo ReSize :
Catch Map
Map
Satellite
Hybrid
You can also use standalone GPS devices to tag your images on a map.
Map data ©2009 MapData Sciences Pty Ltd, PSM

Missed a tutorial?

Go to apcmag.com or www.magshop.com.au for back issues of APC

software and drivers to extract their data. The ATP Photo Finder takes a different approach by including an SD slot: insert your camera card, push a button, and the unit does the matching. And GiSTEQ's CD110BT and Qstarz's Q-1000X use Bluetooth to feed GPS information straight to compatible cameras or computers.

GPS devices use a variety of data formats, with several key formats used depending on the device. These include NMEA 0813, which originated in marine navigation; the XML-based GPS eXchange Format (GPX), Keyhole Markup Language (KML), Openstreetmap OSM, PTH MagicMaps, TK Kompass, and a variety of other formats including proprietary variations of open standards from Sony, Magellan, Garmin and others.

Fortunately, the industry has converged around GPX and NMEA formats for mainstream data loggers, and KML for transferring tracks and geographic information into Google Earth. A variety of free tools and web sites like **www.gpsvisualizer.com** and **www.h-schmidt.net/NMEA** offer conversion from GPX and NMEA to KML, while commercial solutions like ExpertGPS and KML Manager provide back-and-forth conversion between a range of formats.

GPS, CHECK. NOW WHAT?

Technology aside, one thing stopping many people from expending effort on geotagging is the simple question of why they would want to do it. This has kept geotagging in the domain of photographic obsessives, although vendors are inching towards wider markets by building geotagging capabilities into mainstream applications.

The market is fragmented, but options worth exploring include JetPhoto (**www.jetphotosoft.com**, Win/Mac), Gisteq PhotoTrackr Lite (**www.gisteq.com**, Win/Mac; Pro works with RAW images), Immageo (**www.immageo.com**, Win), PixGPS (**www.br-software.com**, Win), Pro Photo Tools (**www.microsoft.com/prophoto/downloads/tools.aspx**, Win), Picasa (**picasa.google.com**, Win), RoboGEO (**www.robogeo.com**, Win) and HoudahGeo (**www.houdah.com**, Mac).

Each has different combinations of features, but most will at a minimum read GPS log files and embed details into your photos, or let you geotag photos manually by locating them on a map. Most standalone readers include, at a minimum, software to geotag photos based on the time they were taken.

Once your photos are geotagged, you can do lots of things with them. iPhoto '09, for example, can use geotagging information to build maps of your travels based on your geotagged photos. iMovie '09 does the same for movies, adding an Indiana Jones-like cutscene based on the locations in your content. Standalone tools (including many of those mentioned above) can group and publish geotagged photos in a variety of interesting ways that bring new variety to the conventional slide show or dizzying thumbnail view.

A new breed of online sites are quickly adding geographical features to their social-networking capabilities. Photo sharing sites allow browsing of pictures by location, while more specialised sites like Locr.com combine photos with a Google Maps interface, thumbnails of nearby photos, and comments to turn a group of geotagged photos into a guided tour of an area.

Geotaggers can also be useful not only for tagging your photos, but for building records of trips you have taken. Throw your geotagger in a pocket during a long bike ride or jog through the park, and you can easily plot your path — and speed — by importing the log file to online geotagging sites like **GPSed.com** and **EveryTrail.com**, which let members share photos and maps of various trips they have taken. You can also add GPS tracks to Google Earth by converting your log file to Google Earth's KML format, then double-clicking on the KML file. APC

MORE ABOUT... GEOTAGGING, STRAIGHT UP

While third-party apps can do wonders with your geotagged photos, most geotaggers come with time-based software. You don't need to get more detailed than this if you don't want to.

The AMOD GPS Photo Tracker software, for example, offers a single interface screen. First, click on Import Photos to choose the files you want to geotag. Then, click on Import GPS Logs to choose the log file copied from your geotagger. The program will match the GPS log time with the EXIF date and time in your files, and suggest a latitude and longitude for each photo.

If you want to see an individual picture's location, click 'Display on Google Maps' and you'll get a separate Google Maps window showing your photo and a marker to illustrate its location. Click 'Catch Map' to save this as an image, or use the normal Google Maps controls to switch to satellite or hybrid views, zoom in and out, and pan around the area.

If you notice that some of the locations seem to be a bit out of time, it's likely a time sync problem between the GPS and your camera. This is easily fixed: click Time Sync and adjust the various counters until they are in sync.

When you're done, select the photos that have been geotagged, then choose 'Save Tagged Photos'. You now have a directory full of geotagged photos that can be imported into any geotag-capable application.

GEOTAGGING

Geotag your photos: part 2

David Braue takes you through a step-by-step guide to geotagging, from trip to online map.

WHAT YOU'LL NEED

GPS UNIT
To record your position and match it to your digital camera's timestamps.

DIGITAL CAMERA
Or, best of all, a digital camera with built-in geotagging.

One well-specced, cross-platform geotagging tool is JetPhoto (**www.jetphotosoft.com**), a US$25/$31 Windows and Mac OS X application that comes bundled with many standalone geotaggers in a lite version. JetPhoto imports photos from a camera or computer, then groups the pictures into 'albums' that can be plotted on a Google Maps interface, geotagged using a variety of log files, adjusted for contrast etc, uploaded to Flickr, and output in several ways. For example, JetPhoto can make a Flash photo gallery, lightbox-style web gallery, a web gallery styled after Apple's Cover Flow interface, or publish your geotagged photos onto Google Maps. These options create files organised in directories that can be dragged and dropped onto any web server for geotagged galleries.

1 GATHERING YOUR DATA

To show how easy it is to turn geographical data into gorgeous galleries, we first took a drive around part of Melbourne's Albert Park Lake, along the course followed by Formula 1 drivers every year. We turned on our geotagger — an AMOD AGL3080 purchased for around US$70 ($90) and started driving, snapping pictures along the way.

Hopping out of the car near the boathouse to get up close and personal with the local wildlife, we threw the tiny unit into a jacket pocket and started walking. We then drove along South Melbourne's Clarendon Street for a while before turning off the geotagger.

Loading the data onto the computer was a breeze: we imported the pictures into a folder using Windows Vista's built-in tools, then plugged in the AMOD unit via USB. It mounted as a USB drive, and we dragged the geotagger's log file into the photos' directory.

2 CREATE A JETPHOTO ALBUM

To get the photos into JetPhoto, we started the program and clicked on 'Create A New Album'. We then dragged the photos from their folder and dropped them onto the JetPhoto workspace — the photos were copied into their own folder and ready for manipulation within the program.

After they're imported, JetPhoto shows the pictures in thumbnail view with a calendar showing when they were taken on the righthand side.

Match your images with their geotag to see them plotted on a map, with Wiki info if you're lucky!
Once you're all geotagged you can click through your album to see where in the world each image was taken.

Share your geotagged memories using the Create & Share menu in JetPhoto.
Map | Geotagging- 071
Map | Geotagging- 072
Map | Geotagging- 073
Map | Geotagging- 077
Map | Geotagging- 078
Map | Geotagging- 079
Map
Satellite
Hybrid
Terrain
Photo
Info
Use Google Maps to create a slideshow of where you've been and what you've seen.

3 IMPORT GPS FILE

The next step is to load the GPS log file into JetPhoto. Click on 'GPS&GeoTag/Locate Photos with GPS… then download tracks From File…' and point the program to the log file you copied earlier. You may need to change the file type setting depending on what type of log file your GPS produces: our unit, for example, records in NMEA 0813 format.

Once the data has been imported, you can view the trip you took by clicking 'Show GPS Tracks', which will plot your trip on a map. You can open it with Google Earth, if you're keen.

4 MATCH PHOTOS AND TRACKS

Click Locate Photos, and JetPhoto automatically compares your photos with the log file and assigns each photo a location. You can then click to view them on Google Earth, or close the tagging window and click 'Thumbnail' to go back to your pictures; note the blue 'G' on each picture with a location. If you're tagging any photos that don't have a matching time stamp in the log file, you can geotag them manually by clicking on GPS&Geotag/ Point Photo Location on Map.

5 VIEW IMAGES ON A MAP

Click on Map and you'll see one of your photos and a red pin showing the location it was taken. Click on the blue globe at the top of the side panel and you'll see a closeup of the area as a Google Maps view and, if available, a Wikipedia entry about the particular place you're looking at. Zoom in using the usual Google Map controls and you'll see a red pinhead at each location where you took a picture. Remember that the location represents the location *you* were in with the camera — not the place you were photographing.

If you notice some misalignment between the geotags and the photos, there may be a slight difference between the GPS time and your camera's time. This can be easily corrected by clicking on the clock icon in the right-hand pane, then clicking the gear and the appropriate option. 'Time Difference Retrieve for Selected Photos…' adjusts the EXIF time in increments of half an hour to fix problems caused if you forgot to adjust your digital camera's time zone while travelling; 'Correct Capture Time for Selected Photos' allows you to adjust the time taken by hours, minutes or seconds; play with this, then repeat the matching step, until your photos fall as close as possible to the actual place they were taken.

6 CONSIDER YOURSELF GEOTAGGED

If all you wanted to do was geotag your photos, you're almost there. Add some notes if you like (click on the star atop the right-hand pane to enter them) then click 'EXIF Tools/Merge GPS Metadata into JPEG…' to write the location information into your files. Congratulations — your pictures are now geotagged. If you like, you can click through the photos in your album to see where each one was taken. You can also drag and drop your files from the JetPhoto album into your own image folders or another program.

7 SHARE YOUR GEOTAGGING WITH THE WORLD

Although geotagging your photos for your own use is a great way to remember a trip, it's not all you can do with your photos. The major geotagging applications offer a variety of ways to present your photos. JetPhoto groups these under the Create & Share menu, which lets you make a wallpaper or mobile phone-sized version of your current picture or screensaver of your current album. It can also build a Flash-based slideshow, Flash-based gallery of your photos in a variety of sizes and colours, a Cover Flow-styled web gallery or a more elaborate Lightbox Web Gallery that includes features such as titles and Google Maps links to each photo.

DO THIS... BUILD A GOOGLE MAPS OVERLAY

The most elaborate presentation of your photos, is using JetPhoto to build your own Google Maps overlay on which to present your photos. Click 'GPS&GeoTag/Make Google Map Gallery…' and pick your pin style, default map zoom level and map type and click the button. JetPhoto bundles all the necessary files into a directory that can be viewed on your PC or uploaded to a web server.

NB: if you want to post the photo gallery online, you'll need to get a Google Maps API key from Google. This is free, but you have to have a Gmail or other Google account to activate it; just enter your domain name and you'll get a unique key, which you must enter into JetPhoto before generating the gallery.

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LINUX

Build a turbo audio studio

Linux is a fantastic platform for audio production. **Graham Morrison** shows how to build a production environment.

WHAT YOU'LL NEED

A RELATIVELY RECENT PC
Low latency audio can be demanding on the CPU.

SOME FORM OF AUDIO DEVICE
Your motherboard's built-in sound should be fine.

UBUNTU 8.04 TO 9.04
You'll need the full OS and the ability to download extra packages.

Although it might not seem like it, properly dealing with audio requires an intricately tuned PC. The main issue is audio latency, which refers to both the time it takes for a sound to enter your machine and the time it takes for your machine to produce a sound. In everyday use, we don't really notice this latency. When you click on a button that makes a beep, you don't care that it might take several hundred milliseconds for the sound to reach your ears. But in the delicate world of audio engineering, several hundreds of milliseconds is far too long — and even a delay of just tens of milliseconds is undesirable.

Most professional systems will try to reduce audio latency to less than 10 milliseconds — faster than the average seek time on most hard drives. Some systems will get it down as low as 2 or 3ms, enabling them to process vocals and instruments in real time, play software synthesizers just as they would the physical type, and mix and master recordings with the same near-zero latency as an analogue tape machine. On Windows systems, this low-latency is produced by the ASIO driver framework that's used by many pro-level audio cards to communicate with apps like Steinberg's Cubase and Ableton's Live. On OS X, however, a low-latency audio framework is built into the operating system, and it's a similar case with Linux.

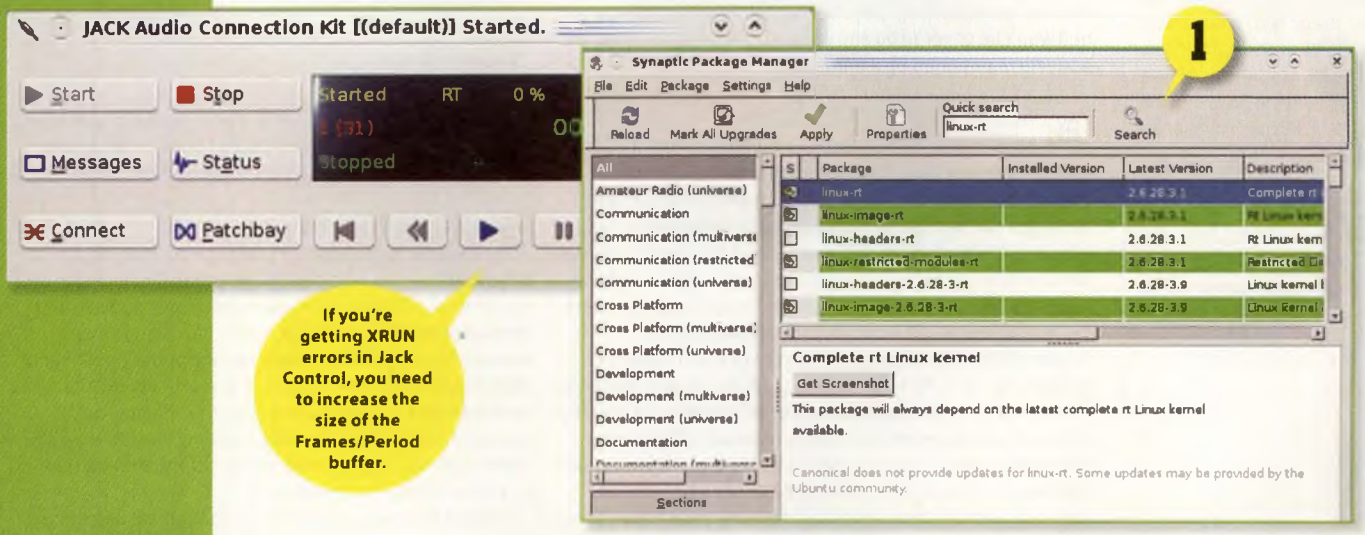
ALSA, or the Advanced Linux Sound Architecture, sits within the Linux kernel itself as a series of hardware drivers. Audio data is passed from ALSA to the user-level applications that manipulate the audio. But despite this low-level integration and a built-in potential for good low-latency performance, most default Linux installations make poor audio production computers. That's because there's still too much going on in the background, and too many throwbacks from the time when Linux was designed primarily for server installation.

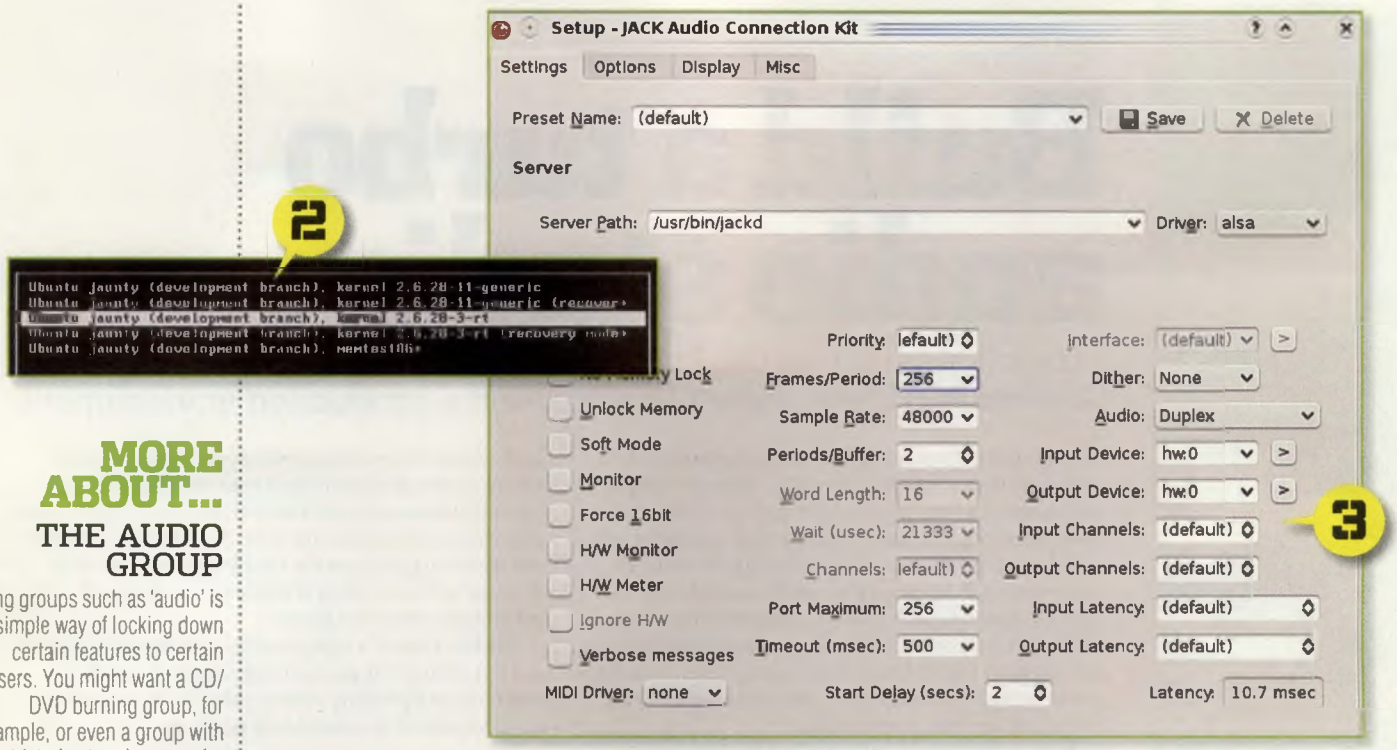
Luckily, Linux is a highly configurable operating system, and this means that you can create the perfect audio platform just by making a few tweaks. We've chosen the latest version of Ubuntu to be our guinea pig.

1 GET A REAL TIME KERNEL

The key to getting audio latency as low as possible is to remove all obstacles to a fast response time, and the place to start is with the kernel. The Linux kernel is made up of a series of modules that huddle together to form the monolithic chunk of functionality. Some of these modules are designed to provide super-low latency operation, but they can have unwanted side-effects for general computer use. As a result, these modules are rarely enabled by default.

These real time kernel enhancements were introduced to the mainstream kernel several years ago, and together they can have a massive effect on how your system handles audio processing. Without the real-time enhancements, the kernel can respond to an interrupt





MORE ABOUT...

THE AUDIO GROUP

Using groups such as 'audio' is a simple way of locking down certain features to certain users. You might want a CD/DVD burning group, for example, or even a group with restricted network access for children. The real-time kernel introduces a few security issues, which is why it's necessary to use an 'audio' group to restrict access to those features. You can quickly check which groups you're a member of by typing 'groups' on the command line.

SWITCH KERNELS

If you decide that you'd rather boot into the real-time kernel permanently, you can change which boot option is selected by default. With system administrator's privileges, open '/boot/grub/menu.lst' in a text editor. At the bottom of the file, you'll find each boot entry separated by the 'title' keyword. You need to move the 'savedefault' line from the old entry to the new one, and when you next restart your machine, this kernel will be chosen by default.

within about 600 milliseconds. With the enhancements enabled, that time is reduced to around 20 milliseconds. Those numbers might seem minute, but they can have a dramatic effect on your audio latency when your system's kernel is dealing with hundreds of interrupts a second.

We wouldn't advise installing the real-time kernel enhancements onto a machine you need to rely on, though. They're disabled simply because they're unstable. Happily, however, both sets of the kernel can coexist within the same Linux installation: you simply choose which to use from the Grub boot menu.

In Ubuntu, the real-time kernel can be installed through the package manager just like any other addition. Search for 'linux-rt' and install both the main package and the 'linux-headers-rt' package that appear. Both of these packages, and the resulting dependencies, are from the Multiverse repository. This means that they're unofficial and won't be covered by any security patches, but they are actively maintained by a third party.

2 INSTALL AUDIO SOFTWARE

After the kernel has been installed, you will need to restart your machine. When you get to the brief Ubuntu boot menu, press Esc to get to the Options screen. From here, you can choose between your standard kernel (most probably labelled '-generic') and the real-time version we've just installed (labelled '-rt'). Choose this and press Enter to boot into the real-time environment. This is the point where the new kernel may cause some problems. As it's responsible for all of the hardware connected to your PC, everything will need to be re-detected. On our test machine, for example, the display's native resolution wasn't correctly detected and we needed to fix this manually. If you use proprietary drivers, such as those for Nvidia hardware, you will have to make sure that these have been reinstalled. Ubuntu's package manager should have grabbed the restricted modules to do this automatically, but if not, you'll need to install the driver manually.

Now that you've got a working low-latency desktop, it's time to install the audio production environment. Ubuntu's package manager makes this easy. Just search for 'ubuntustudio-audio' in Synaptic, and install the resulting package. This includes the cream of Linux audio software and gives you everything that you need to get started with your low-latency audio environment. After those packages have installed, there are a couple of housekeeping tasks to perform. First, load up the User Manager from the System menu, and add any user that you want to have access to the low-latency audio features to the 'audio' group. This should also include your user account. Secondly, add the following two lines to your '/etc/ security/limits.conf' file using administrator privileges:

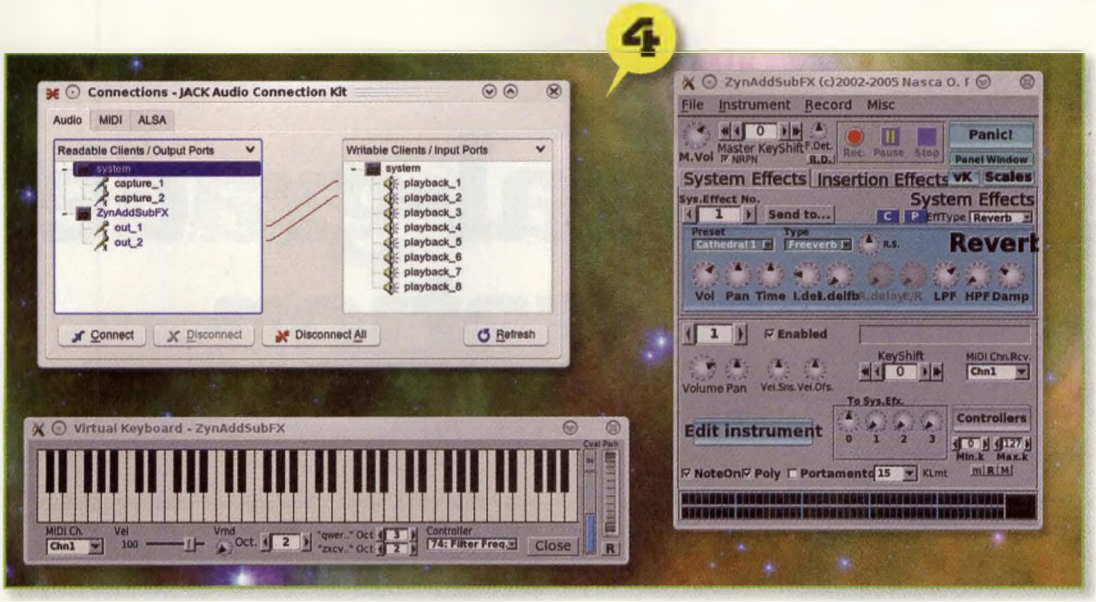
```
@audio - rtprio 99
@audio - nice -10
```

When you've finished, restart your machine, and don't forget to choose the real-time kernel from the Grub boot menu. It's now time to play with some audio software.

3 CONFIGURE JACK

The tool at the heart of the Linux audio system is called Jack — the Jack Audio Connection Kit. Jack sits on top of the ALSA layer and dynamically pipes audio to and from a series of inputs and outputs. It's a very clever solution to an age-old problem: routing audio input to your sound card from one application to another before it makes its way to an audio output like your headphones or speakers. Jack does this without adding any latency. It's been such a success on the Linux platform that you can now find it doing the same job on OS X.

Before we can dive into things, though, we need to get



the service started. Jack runs as a background daemon, and you can use a GUI to control the connections to and from your hardware and software. The best software we've found for controlling Jack is Qjackctl, which is installed as part of the Ubuntu Studio package. Look for 'Jack Control' in the Multimedia menu. When the app appears, click on the 'Setup' button. Getting Jack's set-up parameters right is often a matter of trial and error. Your settings will be different to ours, as they're dependent on your specific audio hardware.

Make sure that the sample rate is compatible with your hardware. Most motherboard-based devices, and those from Creative and ASUS, use 48,000Hz. Ensure 'Real-time' is enabled, as this was the reason for installing the enhanced kernel.

Use the drop-down menu to the right of the 'Interface' field to select your audio device: this is normally going to be 'hw:0', ALSA-speak for the first device on your system. Finally, set the 'Frames/Period' size to 512. This is the size of the buffer used by Jack, and it has a direct effect on the audio latency of your system. The 512 setting works out at around 20ms from input to output, but you should be able to lower this when you're sure that your system is working.

Save the configuration as a preset at the top of the window, then close the set-up window. Finally, when you get back to the main Jack Control window, click on the 'Start' button to start the background daemon running. If everything has been configured correctly, you should see a yellow 'Started' in the faux LCD panel, and you will now be able to start playing around with Jack. If you don't see this word in the panel, click on the 'Messages' button to see a report of any launch errors.

4 CONNECT THE APPS

You've done the hard part, so now it's time to put it to some use. Click on the 'Connect' button in Jack Control and you'll see two panels in the Audio tab. The panel on the left lists the software and hardware sound generators, while the panel on the right lists the software and hardware outputs. At this point there is no other Jack software running, so under the system clients you should see only the hardware connections for your audio device.

To rectify this, look for an application called 'Zynaddsubfx' in your Multimedia menu. This is a rather excellent software synthesizer cunningly disguised by a silly name and dodgy UI. If you've still got Jack's Connect window open when Zynaddsubfx launches, you'll see an additional node in the output panel appear. This will connect its output to your sound card's direct output on the right-hand side. Click on the 'VK' button in the Synth window, and a virtual keyboard will appear. Press a few keys on this and you'll hear a sound, hopefully with very little latency. Congratulations: you're now using a real-time kernel and the Jack Audio Connection Kit to generate sound.

GET RECORDING

To build a production environment, you'll need to run a piece of audio workstation software that can manage all of these components. There are two widely used applications on Linux. Rosegarden is a KDE application that can record both audio and MIDI, and it can also use the new DSSI open-source synthesiser standard. However, our favourite is Ardour, a comprehensive recording environment that has more in common with Pro-Tools than Cubase. Ardour works exclusively with Jack to create a studio environment in software. If you launch the app from the Multimedia menu and create a new project, you'll see the Jack connection window spring into life. Every track, effects send and audio bus in Ardour uses Jack. This is initially overwhelming, but it does mean that you're free to use Ardour as you would a multitrack recorder in a studio, routing and re-routing audio between your various devices.

To record output from Zynaddsubfx, right-click in the lower part of Ardour's main window and add a stereo track. Open the Jack connection window, select the two outputs from the synth and the two system output ports that they're connected to, and click on 'Disconnect'. Now connect each synth output to 'Audio/In1' and 'Audio/In2' under the Ardour client in the right panel. These are the two channels of the stereo track that we just created. Press the 'Record enable' button in the Ardour track followed by the big record and play buttons on the transport control, and play something on the synth. Ardour will now record the digital audio output from the synth, and you should be able to see some of this setup's amazing potential.

DO THIS... BUILD AN EFFECTS UNIT

There are hundreds of real-time audio effects available for Linux, ranging from delays and reverb to chorus, flanging, compression and distortion. Thanks to Jack, you can combine any of these and process incoming audio on your system. Most effects can be installed through the Synaptic package manager. Just search and install the 'ubuntustudio-audio-plugins' package, as well as a tool called 'jack-rack' if it's not already installed. Make sure that Jack is running and launch Jack rack. This little tool emulates a studio effects rack. Click on the 'Add' button and all your system's installed audio effects will be listed. Select the 'Phaser1' effect, for instance, and the parameters will be loaded into the main interface.

You now need to open the connect page from Jack control, and pipe some audio through the Jack rack application. To process a microphone input, for example, click on the system input for the mic in the left panel and the Jack rack inputs on the right, and click 'connect'. Then take the output from the Jack rack on the left and connect it to your system outputs on the right. Any audio that runs through the effects rack will be processed with your selection of effects, and you'll hear the results in real-time. If you come up with a particularly good combination, you can save that configuration as a preset. Handily, this means that you can come back to the same setup at a later date.

HYPER-V

Industrial-grade virtualisation

It's a powerful virtualisation platform and it's free. **James Bannan** explains how to get Microsoft's Hyper-V Server up and running.

WHAT YOU'LL NEED

HYPER-V SERVER R2

Hyper-V server supports up to 4 CPUs with up to 4 cores each, 32GB RAM (1GB is reserved for the parent OS) and a maximum of 192 virtual clients. It is a 64-bit OS, so the system CPU must be 64-bit and support either Intel VT or AMD-V, as well as hardware-based DEP. Most relatively recent CPUs meet these requirements. The (supported) virtual clients can be Windows XP/Vista/2000/2003/2008 or SUSE Linux Enterprise 10 and can be either 32-bit or 64-bit.

Last month in Insider Tips I wrote about Hyper-V Server, which is Microsoft's free virtualisation server platform. Built on Server 2008, it lets you set up a system for hosting virtual machines on the Hyper-V hypervisor. It's flexible enough for home users and powerful enough for businesses. This month we'll get an example going.

CONFIGURATION

When the desktop loads, you're presented with an interface very similar to a Server 2008 Core system: no GUI and a command window. With a few exceptions, everything in Hyper-V Server is command driven, but with Hyper-V Server you're also given a Server Configuration script. It loads automatically on logon (functionality which you can disable) but to call it from any command window, type in SCONFIG. If you accidentally close all the command windows (which is easy to do!) hit CTRL-SHIFT-ESC to launch Task Manager, then go File > New Task > cmd > OK to spawn a new command window.

The Server Configuration window is a series of scripts which you use to configure the server: hostname, networking and so on. To run a script simply type in the appropriate number and hit Enter. Change the workgroup/domain information and hostname accordingly: the hostname change will require a reboot to take effect, as will joining a domain, which also requires an active network connection (in this sense "active" just means "plugged in").

Use option 3 to add a local Administrator: this is needed for authenticated remote management.

In a domain environment use DOMAIN\Username syntax and in a workgroup type in a username which is the same as the one you will be managing the server from. Authentication in these scenarios is quite seamless, but the accounts have to match up, so if your username on the management workstation is "PeterS", then type that in on the Hyper-V server exactly. When prompted for the password, again use exactly the same password as on the management system. Then log off and log back on with the new administrator account.

To configure networking you need at least one active NIC. In a production environment two or more NICs are recommended: one for server management and the others for virtual machines. Server 2008 R2 has extensive native driver compatibility, so you shouldn't have any connectivity issues. Use option 8 to configure the network adaptors individually: you don't need to set a static IP address, but it's convenient for remote management. If you want to be able to download OS updates (a good idea) the system will need DNS settings. Once done, go back to the main menu.

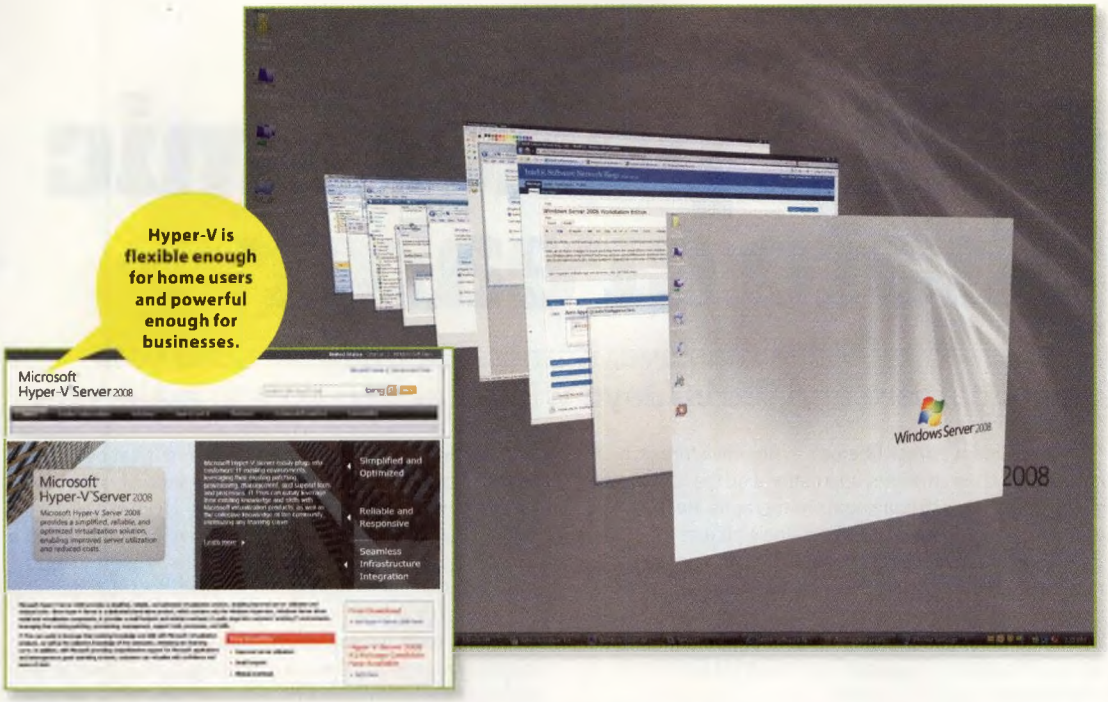
To run an online update the system will need internet access. By default Windows updates are set to run manually: use option 5 to change this if required, and option 6 to connect to Windows Update and download the latest patches. In an environment with WSUS you can add registry entries manually or via Group Policy to change the update location — the Manual/Automatic settings work the same way.

REMOTE MANAGEMENT

Once the network stack is up and running you can configure remote desktop and remote management. Use option 7 to enable Remote Desktop (RDP) — if you choose to only allow clients using NLA (Network Level Authentication) then only Windows Vista and Windows 7 clients can RDP to the Hyper-V system. Allowing clients without NLA is less secure but then you can remote in from earlier versions of Windows. To authenticate in a workgroup environment, use SERVERNAME\Username as the syntax. Logging in remotely will terminate any active desktop sessions for that user.

Next, use option 4 to enable remote administration (by default the server is locked down). For full remote management you need to allow MMC Remote Management (Option 1), enable Windows PowerShell (Option 2 — reboot) and allow Server Manager Remote Management (Option 3).

Now download Hyper-V Manager, which is a free download from Microsoft. It's available as a standalone package and is also bundled into the Remote Server


Hyper-V is flexible enough for home users and powerful enough for businesses.
Microsoft Hyper-V Server 2008
Simplified and Optimized
Reliable and Responsive
Seamless Infrastructure Integration
Windows Server 2008
2008

Administration Tools (RSAT) package, which is available for both Windows Vista SP1 and Windows 7. If you install RSAT you have to enable the specific management features from 'Control Panel > Programs > Turn Windows feature on or off'. Then navigate to Remote Server Administration Tools, tick the extras you want to enable and click OK. The admin snap-ins are then accessible via Administrative Tools.

In a trusted domain environment, that's all you need to do, as security accounts work seamlessly across systems. In any other environment there's more configuration needed, as local security accounts on different machines don't share the same unique identification information even if they have the same username/password combinations, so we have to change some security and firewall settings. The changes are a bit complex, but fortunately John Howard, a Senior Program Manager in Microsoft's Hyper-V Team, has made a script available which does all the heavy lifting. Head over to **http://code.msdn.microsoft.com/HVRemote** and download the tool, called HVRemote, and copy it to both the server and the client.

On the server, run the following command — cscript hvremote.wsf /mode:client /add:SERVERNAME\Username. This will give the nominated user (your local administrator) all the necessary rights to the various management subsystems. Reboot the server. On the client, you will need to enable MMC firewall rules and allow anonymous DCOM connections (from the server), so run the following two scripts from an elevated command prompt:

```
cscript hvremote.wsf /mode:client /anondcom:grant
cscript hvremote.wsf /mode:client /mmc:enable
```

Reboot the client. Launch Hyper-V Manager and select "Connect to server". Type in the hostname of the Hyper-V Server system and it will populate in the snap-in. If the hostname doesn't resolve DON'T use the IP address — it will cause problems when connecting to VMs. Add a manual entry in the system HOSTS file if need be (c:\Windows\System32\drivers\etc\hosts). Now you have full control of the features and settings of the Hyper-V system and can create and manage virtual machines. **APC**

MORE ABOUT... INSTALLATION

Download the system ISO from *www.microsoft.com/hyper-v-server* and burn it using either the image burn option in Windows 7 (right-click, burn disc image) or a third-party tool like InfraRecorder. You can also transfer the image contents to a USB key for a faster install. Boot the system from DVD/USB and the installer kicks off.

The installer is very streamlined and won't ask much other than the language and to which disk you want Hyper-V Server installed. If you're installing to a disk on a RAID controller you may need to have the drivers handy. Download the latest 64-bit drivers for Server 2008 from the manufacturer's web site and have them on a USB key. It doesn't matter if the key isn't inserted when the system starts; the installer will pick it up on the fly.

Walk away while the system is installed. When it's ready it will prompt you to nominate an Administrator password, and you're done.

PHOTOGRAPHY

Giant panoramic photo creator

Impressed by these massive, immersive images? Grab your digital camera and **Chris Lloyd** will show you how to make one.

WHAT YOU'LL NEED

A DIGITAL CAMERA

No need for anything fancy here: the most basic of snappers will do, though one with lockable focus and exposure will help enormously.

STITCHING SOFTWARE

There are a good few of these suites available. We've used commercial app Autopano Pro here, but there are free programs out there too. See the 'Stitching software' box overleaf for more information.

A TRIPOD

Smaller panoramas are easy enough to take by hand, but if you want to do sweeping panoramas, then a tripod really helps to line things up.

During President Barack Obama's inaugural address, a certain David Bergman set up a camera on the north press gallery and took 220 individual photographs. He then stitched them together to make a single picture 59,783 x 24,658 pixels in size, detailed enough to be able to zoom in to see the faces of the astonishing number of American citizens gathered together on the Washington Mall that day. The image proved hugely popular online, and it brought the site that hosted it — Gigapan — to the attention of the wider world.

While there's nothing new in the practice of creating panoramas by stitching images together, the Gigapan site acts as a portal, bringing them all together in one place and providing dynamic viewing tools and a thriving online community where you can upload and share your work. The site features images from all over the world, covering all sorts of subjects and submitted by both professionals and amateurs.

The site is a lot more impressive and captivating than it perhaps sounds here, so your first step should be to go to the site (**www.gigapan.org**) and explore. Much like clicking around Google Earth, delving into massively detailed photos is fascinating stuff. The sheer size and detail of the images is nothing short of incredible.

From its inception, the idea was to make the site accessible to photographers of all abilities. Anybody can upload 'gigapans' (as the monster images are known on the site), and social interaction between users — extending all the way from comments to proper advice — is very much encouraged.

You don't need to be a really great photographer to create gigapans, and you don't need an overly flashy camera. Given some straightforward, widely available stitching software and a basic camera, anybody can have a go at creating a panoramic picture. Including you. Are you ready?

This panorama of Canberra was taken using an Olympus 725SW. It was shot entirely by hand and consists of multiple images with a total size of 7,941 x 2405 pixels. It's pretty small by Gigapan standards, but still has levels of detail that would be beyond any standard camera's single-picture output.

Hugin is a great solution if you're running Linux.
Stitching quality
Stitching software suite Autopano Pro looks for connections between different photographs and then automatically creates the Gigapan for you.

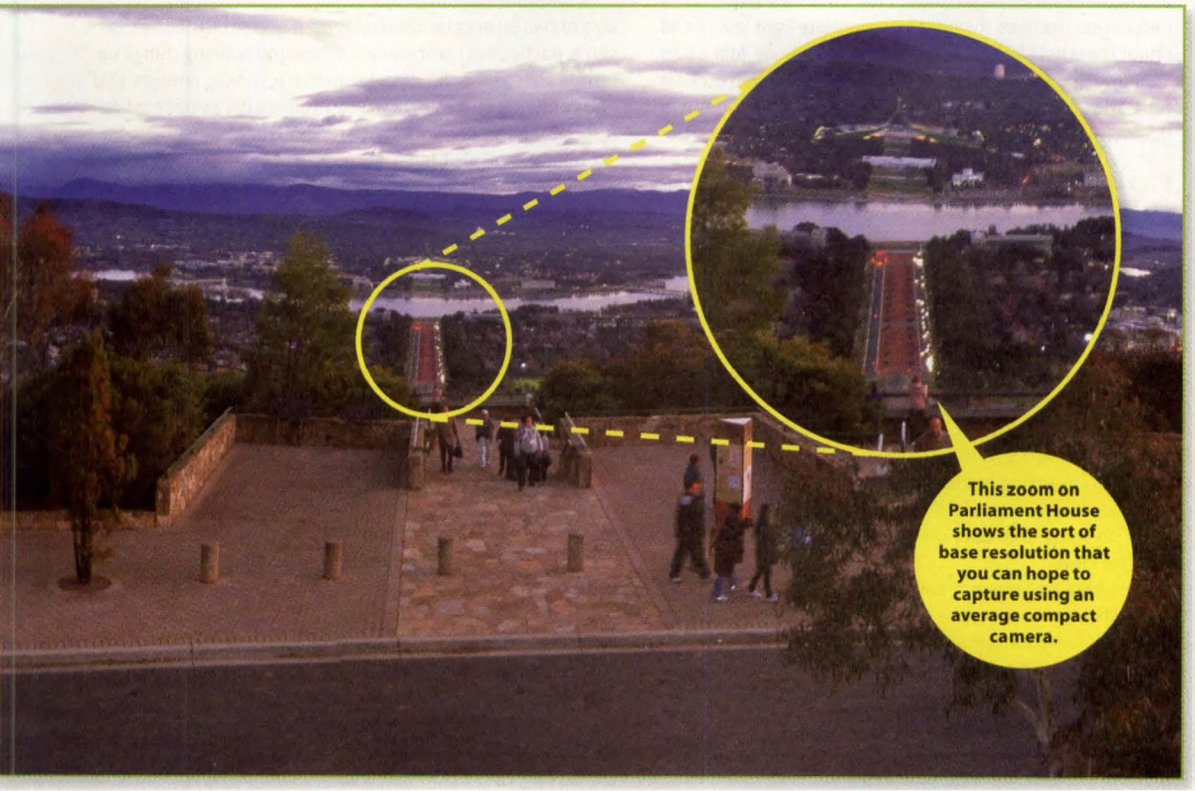
TAKING SUITABLE SNAPS

There is an old saying in photography: you need to get it right in the camera. Such is the case here. Stitching and image-editing software suites have tools to help correct minor problems, but nothing can save your picture if you don't get it right at the start.

Begin by picking a good subject that warrants a gigapixel image: good candidates have lots of points of interest to zoom into. Some picturesque views may be beautiful when viewed in real life, but translate into a sea of uniform fields that make for a truly dull gigapan. Also, remember the vertical element: many landscapes are essentially flat strips along the horizon, so it often pays to get a high viewpoint.

Once you've picked a suitable subject, the three things you need to remember are focus, exposure and framing. Focus comes first. While it's possible to take gigapans of close subjects, it's easiest to start with subjects where you can set the focus to infinity (generally, anything over about 20 feet away).

If your camera can lock its focus, then all's well and good. If not, you might find that its autofocus feature picks out an intervening lamppost or some such object and ruins the shot, so keep an eye on your scene to make sure this


This zoom on Parliament House shows the sort of base resolution that you can hope to capture using an average compact camera.

DO THIS... USING ROBOTS

If you're planning to make really big Gigapans, you'll need a robot. These devices sit on top of a tripod and move your camera across a defined area, taking images as they go. This technique makes it possible to construct accurate Gigapans consisting of hundreds of images.

Gigapan produces two different models of robot. The Epic, which is designed to hold simple consumer cameras and smaller bridge cameras, sells for US$379, while the Epic 100, a heavier unit capable of taking larger bridge cameras and smaller DSLRs, goes for US$449. Both come with Gigapan's stitching software, which is one of the few packages that can cope with the prodigious numbers of shots that using these machines makes possible. If your Gigapan habit takes off, then this is the sort of kit you'll need to make some really stunning images.

MORE ABOUT... GIGAPAN HISTORY

Although it came to prominence thanks to the stunning image of the recent US presidential election, Gigapan grew out of research carried out for NASA, which needed to stitch together images of the surface of Mars, which were taken by the panning cameras of its Mars Rover. This led to the creation of the first photographic robots, which by association led to the creation of the software needed to control and edit them. A forum to share the resulting images naturally followed, giving us the Gigapan site we see today. The site carries no adverts thanks to sponsorship and funding from research institutions like NASA, Carnegie Mellon University and Google. This is tech that has a lot of potential in the future.

TIP... SHARING CULTURES

Gigapan is much more than just an online gallery. In partnership with UNESCO and National Geographic, it's part of the Global Connection Project. This project strives to bring people together by sharing online dynamic photography and imaging in order to show the culture, ecology and lives of people from all round the world.

Placing images accurately in Google Earth can be a bit fiddly.

You don't need a DSLR to take high-quality Gigapans, although using a tripod with your camera will help.

doesn't happen. Taking images of close objects is trickier, due to the camera's limited depth of field, but is perfectly possible with care.

Images need to have a uniform exposure to avoid a patchwork effect in the field composition. Lock the exposure (either the exposure directly or both the aperture and shutter speed) if possible. Pick a section of the vista before you that has the best intermediate light levels and shoot the whole image locked to that exposure. Make it too light and you'll get dead black shadows, but if you make it too dark, you'll end up with a flat white sky. Experiment if you need to.

FRAMING THE SHOTS

The magic of gigapan photography relies on the stitching software picking out key elements in images and matching them with other images to join adjacent pictures. The software then blends the shots together to make a seamless join (at least, that's the idea). If an image stitches neatly there will be little evidence to indicate that the final result isn't one uniform image, except its sensor-defying size.

On the other hand, nothing can rescue your image if you miss a spot, so it's well worth taking too many images rather than getting home to start processing only to find you've left a blank patch. Try capturing an environment now, anything from your office wall to the view outside your window.

The idea is to leave a massive overlap between pictures: from a third to a half of the image size. It's impossible to take too many photographs — be thankful we live in the digital age — but an overlap of more than a half is no more effective than a third and will just waste valuable processing time in the long run.

Manually keeping track of what you've taken requires a bit of concentration. Pick an easily identifiable marker — a tree or other object — and take your shot. Then move the camera until the object has moved two thirds of the way across your image and shoot again. Repeat this process until you've covered a whole row or column of your final image, then start again with the next logical line of images.

A suitable starting project may be a panorama with a size of two by six standard images. If you're outdoors, the sky is particularly problematic when you're lining things up by eye (not a lot of landmarks up there, funnily enough, and you can't rely on seagulls to stay still) so it's easiest to line up your top row of photos with the horizon.

Taking pictures by hand and building a decent Gigapan is a perfectly feasible project. A tripod makes it even easier, particularly as it means that you can take your time. If you want to get really ambitious, though, a robot is the way to go. It's the only method of reliably taking up to 200 or more photographs without missing anything. See the 'Using robots' box on the previous page for more information.

STITCHING IT ALL TOGETHER

If you've got it right in the camera then stitching the images together to make the Gigapan is remarkably easy — albeit processor-intensive.

Stitching packages all do more or less the same job, but Autopano Pro is able to build multiple images from a jumbled directory of pictures and can automatically detect separate Gigapans. This means that you can just point it at the contents of your camera's SD card and essentially walk away. Brilliant.

Rival software is more exacting and requires images to be separated and numbered in a set pattern. The trial version of Autopano Pro watermarks your picture and can't save edits, but is otherwise fully functional. It's a good place to start experimenting.

If you've got the images right, a few clicks is all that's

SIZE DOES MATTER

This shows just how big Gigapans can be.

The bottom image is Hanauma Bay by Richard Palmer, a perennial favourite on Gigapan and a whopping 5.63 gigapixels. Above that is Corfe Castle by Kilgore661, which weighs in at 2.33 gigapixels. Visit *www.byteswithbite.co.uk/kilgore/org* for more of his work. Above those two is our test image of Canberra, a mere tiddler in comparison, and that blip at the top is a single image from a 10-megapixel camera. That's a good illustration of just how big these images can get, and there are bigger ones than these yet. The current champion weighs in at a massive 10 gigapixels.

Picking less-populated areas is a good idea when taking gigantic Gigapan images, because moving people are harder to stitch into place.

needed to produce your Gigapan. Click on 'File > Select Images' and pick your files. Autopano will analyse them and build a rough view of any Gigapans it finds in the right-hand pane. Click on the 'Edit' button to open the Edit mode window. If you've taken your pictures carefully then everything will stitch together easily.

Click on 'Projection > Cylinder' to change the projection. If your image is basically a narrow strip, then this will make a slightly more accurate projection. You'll also need to crop the image, which is done with a single click on the 'Crop' button. Accept the default settings for now. You're now ready to render, so click on the little gear icon to set things in motion. This might take some time, depending on the complexity of the image and your PC's processing power.

There are many more options available, of course, but these are generally only needed when you've not managed to capture a good set of pictures in the first place. It's possible, for example, to manually set control points, which can result in a much cleaner composite.

One thing that can prove troublesome is if you have people walking about, getting in the way. The blending process will often remove them entirely, and the software is clever enough to realise that elements of one image that are not in another need to be overwritten. However, using a one third overlap means that the middle ninth of each image is unique, so if you've got part of a body in this area then it will stay there. You can take advantage of this to engineer some fun effects, such as having the same person appear a number of times in one image, or hiding some tiny object for people to hunt down.

UPLOAD AND SHARE

Once you're happy with your creation, you'll need to register with the Gigapan site before you can upload your pictures. The first step is to download the dedicated uploading tool. It's worth pointing out that anyone can take small snapshots of your larger images, the first one of which will appear on your listing page, so you might like to take some care picking a reasonably good one before someone else does it for you.

Uploading your Gigapan is very straightforward, and you'll be guided through it by the application. After you've uploaded your image, you'll see a link below it inviting you to place it in Google Earth.

This allows you to 'geocode' the file with enormous accuracy, so people can see exactly where in the world your image was taken. The interactive placement tool fires up the appropriate KML file within Google Earth so you can see the result in situ.

Having an exact longitude and latitude to hand helps, but searching using an address (and picking the exact coordinates from that search) is an equally straightforward way of getting it done.

Don't forget to set the orientation so that your field of view is pointing the right way; putting a flat photograph on the map means this is essential. Pay particular attention to the elevation, which for some reason is set at a default value of 20 metres above the ground. It's a little cumbersome to sort this out, so when you're happy with the Gigapan's location, make sure you save the changes. If you want to share your Gigapan with other Gigapan users in Google Earth then make sure that you've checked the 'Share' checkbox.

Once your efforts are online at Gigapan, you may attract some attention: it has a large community and you'll likely gather snapshots and comments from people all over the world. If the bug bites, then you'll be one of a small but dedicated band of aficionados that are at the forefront of global shared imaging. BBC

MORE ABOUT... STITCHING SOFTWARE

There aren't that many decent stitching packages to choose from. Adobe Photoshop has a rudimentary photo-merge tool that is worth investigating, but if you're after something a bit better, try one of these.

Autopano Pro 2.0

www.autopano.net

€79 (approx. $300)

Autopano Pro is wonderfully easy to use and packed with features. It does suffer from the 'eternal development syndrome,' though. A free trial version is available and it runs on Macs and Linux too.

Gigapan Stitcher

www.gigapansystems.com

US$379

This application is currently only available when purchased with the Gigapan robots, where its ability to process hundreds of images comes into its own. A standalone version is planned at some point in the future.

PTGui

www.ptgui.com

€79 (approx. $130)

PTGui was one of the first stitching packages available, and it's still highly rated with the Gigapan community.

Hugin

http://hugin.sourceforge.net

Free

This open-source app isn't for the technically shy. Though labelled as 'stable', it's also in a constant state of development.

Microsoft ICE

http://tinyurl.com/mfp8up

Free

Microsoft's Image Composite Editor is something of a dark horse. It's free but has no official support and limited features. It's yet to find much favour in the Gigapan world. Still, if you want a free app that's not open-source, it's worth a try.

masterclass
STEP-BY-STEP TRAINING

IN THIS SERIES

Learn how to network every digital device in your home, everywhere from the home theatre to the bedroom. This is the ultimate home-networking tutorial on how to turn your castle into a 21st-Century digital paradise.

APC EXPERT

THE CONNECTED GUY

David Neiger is building the connected house in a real home and will be filing regular columns as he goes along. David is a qualified engineer with many years of networking, IT implementation, consulting and project management experience.

WHAT'S NEXT?

PART 11

NOVEMBER '09 TAKE A LOOK AT THE HOUSE IN 3D

PART 10 CREATE THE ULTIMATE CONNECTED HOME

Wireless network and storage

Before optimising his Connected Home for sound, **David Neiger** needs to bolster the wireless network and sort his storage setup.

Before we explain how to get your house wired for sound we need to optimise the wireless network and look at the best solution for storing all of our music, photos and videos.

As you may recall from earlier tutorials, our network consists of both wired and wireless devices all connected (via several switches) to our Belkin router. The house is connected to the internet via Internode's Naked DSL, which allows us high-speed access to the internet, the Naked referring to the fact that we don't have another phone line for which we pay rental.

We have connected devices to the wired network points in the home theatre room, the games room and upstairs in the study/office. We have also used wireless connections to connect the Xbox, PS3 and the Nokia N96 mobile phone. The Belkin router supports 802.11b and g, which gives us a maximum throughput of 54Mbit/s, although in practice we generally achieve no faster than 20Mbit/s. This is the speed of the routers found in most people's homes, and it's adequate for streaming audio in ideal conditions. But the reality is that when our neighbours are using their networks, cordless phones and other devices, we often experience network congestion, which means that the music stops and starts (as the device attempts to buffer the audio stream). We also have experienced problems with black spots, particularly in the kitchen where we want to install music streaming and internet radio in a coming tutorial. We've also found that the range of the existing 802.11g network is limited to inside the house; we can barely get the signal out to the verandah, let alone the BBQ area out the back.

UPGRADING WIRELESS

It's time to upgrade our wireless network to extend its range to the backyard and take advantage of new technology to minimise interference from the neighbours' networks and cordless devices.

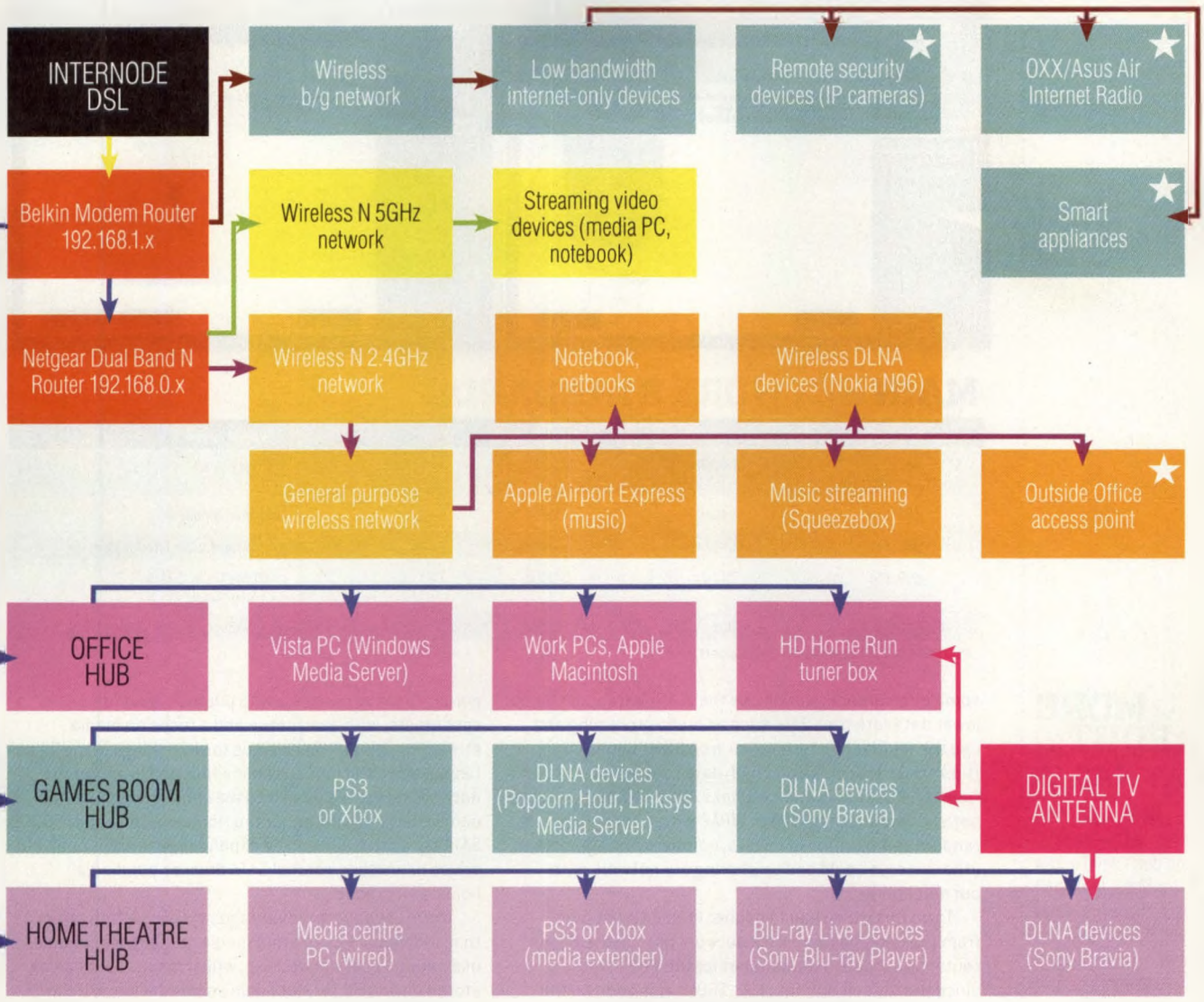
A wireless network consists of a radio transmitter and receiver. The radio signals between each occupy a specific range of frequencies or radio spectrum, and can suffer from interference, the same kind that you might hear if you listen to AM radio and detect whistling or even two radio stations on the same frequency.

Wireless networks are the same. If two wireless networks transmit on the same frequency simultaneously, the information becomes scrambled and the network has to retransmit the data, effectively slowing down data transfer. Collision avoidance techniques also slow the network down, as the devices wait until the network is clear to request permission to send data. If your neighbours are using their network to the max or using other devices such as cordless phones, wireless controllers and television extenders that use the same frequency, your devices will have to wait their turn in order to send data to your network. As you can appreciate, this is like driving on a single lane inner-city road full of parked cars, buses and traffic lights. You can spend more time waiting to get somewhere than actually going anywhere.

Most wireless network standards in use are backwards-compatible, which means that the network will drop down to the lowest speed to support the slowest wireless device on the network. You may think that you have a superfast 802.11n network, but if you have computers connected to it that only support the slower 802.11g standard, your network will be throttled to 802.11g speeds.

For information on the main network standards, see the table (page 100).

The most common standard presently used is 802.11g, which is supported by many devices including the Xbox,


INTERNODE DSL
Wireless b/g network
Low bandwidth internet-only devices
Remote security devices (IP cameras)
OXX/Asus Air Internet Radio
Belkin Modem Router 192.168.1.x
Wireless N 5GHz network
Streaming video devices (media PC, notebook)
Smart appliances
Netgear Dual Band N Router 192.168.0.x
Wireless N 2.4GHz network
Notebook, netbooks
Wireless DLNA devices (Nokia N96)
General purpose wireless network
Apple Airport Express (music)
Music streaming (Squeezebox)
Outside Office access point
OFFICE HUB
Vista PC (Windows Media Server)
Work PCs, Apple Macintosh
HD Home Run tuner box
GAMES ROOM HUB
PS3 or Xbox
DLNA devices (Popcorn Hour, Linksys Media Server)
DLNA devices (Sony Bravia)
DIGITAL TV ANTENNA
HOME THEATRE HUB
Media centre PC (wired)
PS3 or Xbox (media extender)
Blu-ray Live Devices (Sony Blu-ray Player)
DLNA devices (Sony Bravia)

PS3, internet radios and built-in network cards in notebooks and netbooks. However, as we've explained, the spectrum used by these networks is very crowded and prone to interference.

To improve performance in the Connected House, we are going to upgrade our network to 802.11n (draft) using next-generation dual-band routers. Any of the big router vendors now sell these. We've picked Cisco's Linksys N Ultra Range Plus router. Apart from giving us faster transfer rates, it uses dual radios, allowing us to simultaneously transfer data over the 2.4GHz and 5GHz frequencies, effectively doubling our data transfer bandwidth.

As well as transmitting the data faster (using more advanced encoding systems and multiple data streams), 802.11n devices take advantage of Multiple Input Multiple Output (MIMO) technology, which uses several in-built antennas. MIMO technology is quite complex but effectively it uses the multiple antennas to detect and where possible "correct" errors caused by interference. In other words, MIMO technology should be able to separate the network signal from the interference caused by cordless phones and the neighbours' networks, giving us much faster and reliable data transfer rates. MIMO technology also provides multiple signal paths, which means that one antenna can be used to receive whilst the other antenna simultaneously transmits.

The other advantage of the Linksys N Ultra Range devices is that, being dual band, we can set up two simultaneous transmission paths that will not interfere with each other.

In the Connected Home we will leave our Internode-supplied Belkin router to connect to the internet and to support low-speed (802.11g and 802.11b) internet devices, such as internet radios. For media and data transfer we will set up two new high-speed wireless networks (Linksys24 and Linksys50) which will be used exclusively by our 802.11n devices such as our Toshiba notebook, the Media Center PC (using a Linksys USB dual-band network card) and a netbook (also using the Linksys dual-band card).

Since the 2.4GHz band (Linksys24) is still subject to

THE NETWORK CONNECTIONS

STARRED BOXES
Items yet to be installed

PINK LINE
Antenna connections

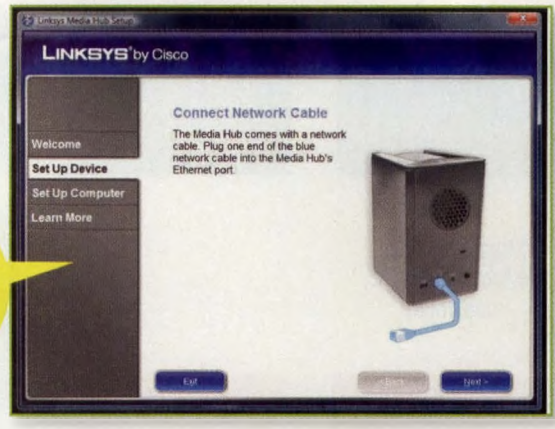
BLUE LINE
Wired ethernet connections

YELLOW LINE
Naked DSL to Internode

RED LINES
Internet-only b/g network

PURPLE LINES
Linksys 2.4GHz N network

GREEN LINES
Linksys 5GHz N network


LINKSYS by Cisco
Welcome
Set Up Device
Set Up Computer
Learn More
Connect Network Cable
The Media Hub comes with a network cable. Plug one end of the blue network cable into the Media Hub's Ethernet port.
Exit
< Back
Next >

Setting up the Media Hub shouldn't be too taxing.

MAIN NETWORK STANDARDS

Standard	Frequency	Maximum speed	Typical speed
802.11 (largely obsolete)	2.4GHz	1–2Mbit/s	Very slow
802.11b	2.4GHz	11Mbit/s	Less than 5Mbit/s
802.11g	2.4GHz	54Mbit/s	10–20Mbit/s depending upon interference
802.11a	5GHz	54Mbit/s	20Mbit/s in close range
802.11n (draft)	2.4GHz or 5GHz	Up to 600Mbit/s *	Up to 144Mbit/s with compatible devices

* Current 802.11n (draft) devices support maxi

MORE ABOUT... WHAT NAS IS

A NAS is effectively a small file server, but unlike a file server, you don't need to run a PC (or Mac), you don't need to purchase Windows Server 2008 or become familiar with Linux and you don't have to continuously apply service packs to it! A NAS is also much easier to use than a file server since it is controlled via a web interface and requires almost no administration.

some interference, we will use the 2.4GHz transmitter for lower data rate transfers such as audio streaming and use the relatively interference-free 5GHz band (Linksys50) for video and high data rate transfers to and from the PCs, a NAS and netbooks. We'll obviously secure both networks using WPA or WPA2 with a hard-to-guess random combination of letters, numbers and symbols, otherwise we could end up sharing our network with our neighbours.

To do this we've had to connect the internet port from the Linksys router to a network port on the Belkin router and create a new subnet for the Belkin router, since the default subnet (192.168.1.x) is used by the Linksys router. We've reconfigured the Belkin router to use the 192.168.0.x subnet, which is no problem since the Linksys router uses DHCP to automatically acquire a private IP address from the Belkin router and connect to the internet. Finally we've had to move all of our computers, printers and wireless devices over to the Linksys router (to take advantage of Gigabit Ethernet) and to ensure that devices are all on the same subnet so that Windows can easily locate them using NETBIOS. It is possible to have internet-only devices on the Belkin subnet provided your PCs do not need to access them or share content with them, since they will not be detected unless you specify them in the PC's individual host files.

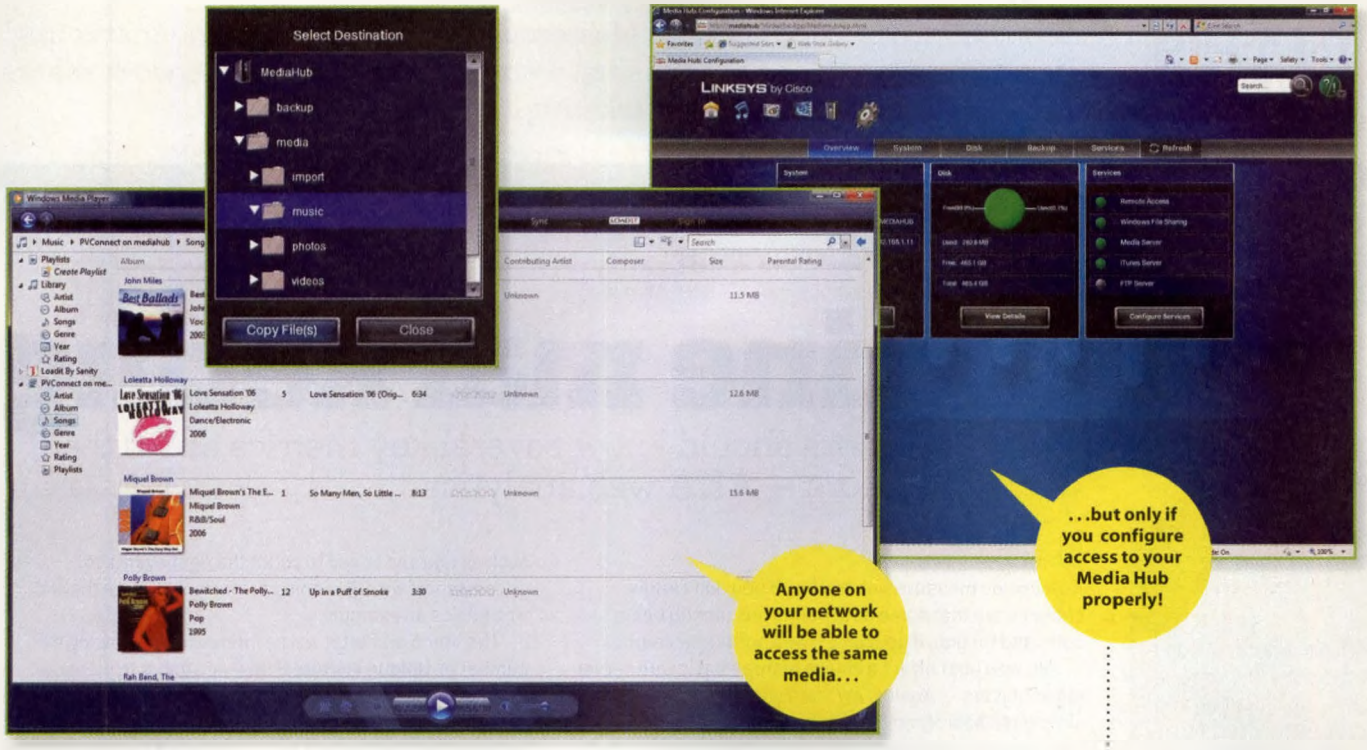
NAS FOR STORAGE

The next piece of infrastructure we've installed is a NAS (network attached storage) device, which provides a central storage point on the network for everyone's multimedia files. While the choice of NAS devices is now growing exponentially as more users take up this elegant solution, we're aware not all our readers are networking gurus, so we've chosen a NAS purpose-built for consumers, with easy setup and a focus on media streaming. It's also allowed us to keep things in the Cisco family, since the Linksys Media Hub NAS is part of the networking giant's push into the consumer space. The unit we have in the Connected Home has an inbuilt 500GB SATA hard drive and can be expanded with additional USB drives or another internal SATA drive as our media holdings increase.

There are several advantages to using a NAS rather than individual PCs to store media content. Most homes use peer-to-peer networking, which means data can be stored on any PC (or Mac) using shared folders. If the PC is turned off or crashes you cannot retrieve the content. Transferring data from the PC when streaming music or video requires some CPU and network resources. Most current PCs are powerful enough to stream media and be used for light tasks such as word processing or browsing the internet but even a powerful machine can struggle with decoding video or playing games whilst simultaneously streaming high-definition video over the network. If the PC holding the content is heavily used, you will experience stuttering playback.

The other problem with having your content spread out across the network is that it is difficult to access and manage. You need to know which machine and share has the content, and you can waste a lot of time browsing through folders to find the media file you are looking for. Backups also become a nightmare, which is why I have always recommend that you store all of your media content in the one main folder with several subfolders.

The Linksys Media Hub is a purpose-built NAS designed to acquire, store and distribute media content and is much easier to install and use than a file server. The Linksys install wizard guides you through the steps



of installing the Hub, but the process is so simple, the wizard basically comprises animated pictures showing you how to plug in a network and power cable.

After you have done this the wizard should find the Media Hub and automatically point your browser to it, but if you just want to get on with the installation you can simply type http:\\mediahub into your browser to access the device. If for some reason you cannot locate the Media Hub on your network, you simply go to the front panel and use the built-in colour LCD screen to provide status information on the Media Hub, including the assigned IP address. Once you have the IP address of the Media Hub, you can simply type that into the browser and begin setting up the NAS.

As with any new device, the first thing to do is to check for firmware updates. You can do this from the front panel of the Media Hub, and if there are updates they will be installed.

You may then want to secure the administration section of the Media Hub by changing the default password from the (glaring obvious) "password". The Media Hub will search your network for DLNA (see *APC* September for an explanation of this), Windows Media and iTunes-compatible media devices and list all of the content it has found on the network. Unlike a file server, the Media Hub sorts the content by type (music, photos and videos) and reads the ID3 tags in the files to allow you to find music by album, artist and song title. The web interface also allows you to search your collection and play the music directly from the browser, irrespective of where the files are physically located.

Of course the main benefit of having a NAS is to be able to store files directly on the device rather than spread throughout the network. You can copy files to the Media Hub NAS using various ways. To Windows computers, the Media Hub just looks like another Windows share so you can simply browse the network for MEDIAHUB, map a drive to the media folder and copy files using Explorer. You can also use the web interface to copy files from other devices (such as other media servers) although we noticed that the Media Hub will duplicate the file ending on m4a (iTunes) files so that song.m4a is copied as song.m4a.m4a. This can be fixed by connecting to the shared drive and renaming the files.

By default everyone has guest access to the Media Hub, but if you want to restrict access you can do so by assigning a guest password from the configuration screen. The configuration screens also allow you to rename the Media Hub (from the default MEDIAHUB), assign it to a workgroup (to make it easier for Windows machines to find it) and set the timezone.

One of the best features of the Linksys Media Hub (as compared to an ordinary NAS) is that you can remotely access it from the internet, even if you don't have a fixed IP address. To enable this feature you need to turn on remote access and assign a remote device name. Once this has been done, you simply go to **www.CiscoMediaHub.com** and enter your device name to log on remotely. You will be prompted to enter your password (either guest or admin), which is why it is essential that you firstly pick a device name that is not obvious and change the default passwords otherwise you may get into serious trouble if hackers upload illegal content onto your NAS! My recommendation is that, as cool as this feature is, don't enable remote access unless you really need it and are prepared to accept the risks.

Now that our infrastructure has been upgraded we are finally ready to install our audio devices around the home and enjoy stutter-free audio and video streaming. APC

DO THIS... NAS SAVES POWER!

If you are looking to become more environmentally friendly — or at least cut your power bills — then a NAS is also a more economical option. Replacing two legacy file servers in my office with a NAS cut my electricity bill by nearly $20 per month! This is because a NAS such as the Linksys Media Hub only uses 60W of power compared to the 200-600W of power that even a small file server consumes.

IN THIS SERIES

Ash Nallawalla continues his Masterclass, focusing on online marketing. This will cover online advertising, web site monetisation, network marketing, blogging for profit, affiliate marketing... and more!

APC EXPERT

ASH NALLAWALLA

Ash manages natural and paid search traffic for some of Australia's largest web sites. He is an internationally acknowledged expert in search marketing, and he previously operated an SEO training business. Recently, he presented two sessions at the WebmasterWorld Conference in Las Vegas, which he has written up at his blog **www.netmagellan.com**. Ash can be contacted at **ash@crm911.com**.

WHAT'S NEXT?

PART 2

NOVEMBER '09 GOOGLE ANALYTICS

Will take a look at more jargon and introduce you to its rich feature set.

PART 1 WEB ANALYTICS

Online marketing

Web site owners should know several key metrics about their web site visitors — AKA web analytics.

BASICS

How do you measure web traffic? If you don't know, chances are that some data points are silently being collected for you, if you have a web hosting account.

My web host offers a choice of three basic web server log analysers — Analog, AWStats and Webalizer. Analog is simply too basic for my liking, so I don't even enable it — web logs take up space that could be better used for web site content. I look at Webalizer stats once in a blue moon and look at AWStats a little more often. If I don't sound too excited by these packages, it will be clearer next month.

TYPES OF WEB ANALYTICS

There are two ways to measure web site traffic, and each method has further options:

- Server log file analysis
- Page tagging

SERVER LOGS

Most (if not all) web sites run a process of logging every web activity in files known as server logs. Some sites keep these logs indefinitely; others delete them after some time, because they can grow rapidly at a busy site. This is a good time to introduce some jargon that is sometimes misused.

SOME TERMINOLOGY

A **Hit** is an entry in the server log and represents a file request. When a human visitor comes to your home page and goes no further, that single action generates several hits. For each entry, the log records the IP address, date, time and the file that was displayed or activated. In the early days of the web, there were no images on a web page, so it was fine to count hits because each page view generated just one hit. Over the years, web pages became richer.

For some of my sites, a single page load could generate ten or more hits — the page itself, the external JavaScript and CSS files and the media on the page, such as pictures, video or sound clips.

If I wanted to misrepresent the amount of traffic I was getting, I would mention Hits, not Page Views, or Unique Visitors, or Visits (or Sessions). That would make my site seem ten times busier than it really was. Honest people such as you and I need to count the right events to understand if we are winning or losing. Let's use the *APC* web site as an example.

The brand marketer will be interested in knowing the number of **Unique Visitors** if the intention is to measure advertising or brand exposure. The editor might be more concerned with usage, so the number of Visits and Return Visitors would be a better metric for him. If the stats can be segregated into site sections, such as News, Reviews, How-To, and Forums, the webmaster could report on the popularity of different parts of the site or check whether the site design could be a reason for a section being overlooked by most visitors. The advertising manager will be interested in Page Views because many ads are sold per thousand impressions; therefore, you will notice a page refreshing itself and showing new ads if you sit on it for an extended time.

LOG FILE ANALYSIS

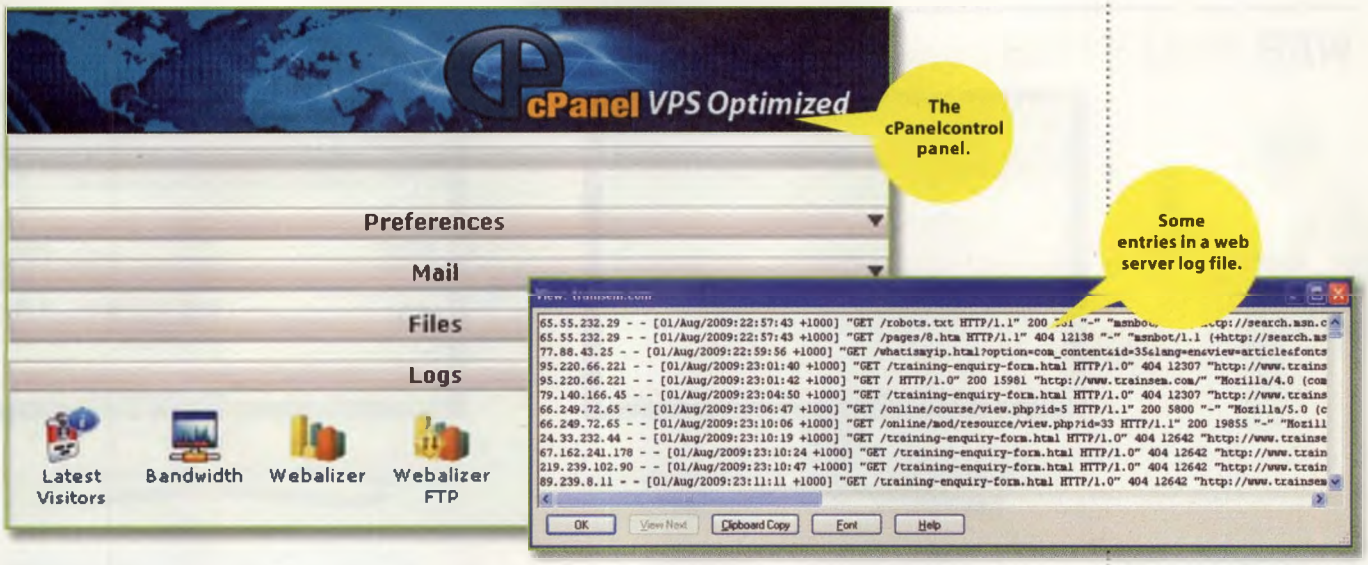
The tools mentioned earlier (and more robust commercial solutions) read the log files and provide reports about the visitor activity on the web site. These logs include visits from search engine spiders and other lesser-known non-human visitors.

These days, it is impossible to count all web site activity, because some of it occurs outside the server. How is that possible?

Some ISPs and companies have a Proxy Cache server and require all users to use it for web surfing. If ten people using a given proxy look at a web page, only the first user will request the web content, while the other nine will fetch it from the proxy cache. All the users will probably display the same IP address — that of the proxy server, not their internal addresses. Proxy caches reduce bandwidth use by not fetching the same files over and over, so they will continue to be popular.

Quite distinct from proxy servers, the web browsers we use also have a cache that eliminates the need to download a page element again if it is requested from another page. This speeds up page load times for subsequent visits until the content has dropped out of the browser cache.

SEOs (Search Engine Optimisers) do need to know about visits from known spiders, such as Google's



Googlebot, Yahoo!'s Slurp or Bing's MSNbot. Then there are robots such as image or mobile content crawlers.

Non-SEOs may want to ignore non-human traffic. They know that many users are assigned a fresh IP address by their ISP, so they serve cookies to identify specific PCs (representing users).

Of course, some users set their browsers to delete all temporary files, cookies and personal information when they close their browsers. A web site relating to privacy or security might have a large audience that likes to hide their tracks, so it will have a harder time analysing its log files.

PAGE TAGGING

Another way of capturing visitor data is by embedding a slab of client-side JavaScript on a page. Google Analytics is a free service that uses this method. Every time a tagged page is loaded, even if it is from a proxy cache, the JavaScript can execute a script at a remote location, usually a third-party analytics provider. Here is an example of an old Google Analytics page tag (the new one is longer):

```
<script src="http://www.google-analytics.com/urchin.js"
type="text/javascript">
</script>
<script type="text/javascript">
_uacct = "UA-123456-78";
urchinTracker();
</script>
```

The JavaScript can collect additional information about the visitor's operating system, screen size, browser name and version, mouse events such as hovering above an object, partial form completion, clicks etc.

If you have a personal web site at a shared web hosting company, you might not have access to the web server logs or it might be tedious for you to download them and parse them at your end. Page tagging is the better option for you. Just ensure that every page contains the tag code.

Some services offer the JavaScript as well as a 1 x 1 pixel transparent GIF image as a web "bug". If a human has turned off JavaScript, chances are that images are not turned off and this invisible image will serve as a less comprehensive alternative. This image should also be referenced on every page. Pages with a lot of content might load slowly and the visitor might move away from a partially loaded page before the browser encounters the JavaScript at the end. Ordinarily, this page visit might be missed, but the invisible image placed higher up on the page will record the visit.

Another limitation of this approach is that it cannot record the path taken inside a PDF file that is a large document. A proprietary content management system (CMS) might not have the flexibility to let you drop JavaScript on every page.

TYPES OF VISITORS

Web site visitors include both good humans or spiders, and bad ones. It is important to become familiar with the regular visitors and to understand the motives of newcomers, who might not have good intentions.

GOOD GUYS

Search engine spiders look like this:

- 66.249.72.65 - - [01/Aug/2009:23:06:47 +1000] "GET /online/course/view.php?id=5 HTTP/1.1" 200 5800 "-" "Mozilla/5.0 (compatible; Googlebot/2.1; +http://www.google.com/bot.html)"
- 65.55.232.29 - - [02/Aug/2009:00:16:22 +1000] "GET /sitemap.xml HTTP/1.1" 404 - "-" "msnbot/1.1 (+http://search.msn.com/msnbot.htm)"
- 74.6.18.254 - - [02/Aug/2009:00:31:17 +1000] "GET /Links/Tools/iDevAffiliate.html HTTP/1.0" 301 - "-" "Mozilla/5.0 (compatible; Yahoo! Slurp/3.0; http://help.yahoo.com/help/us/ysearch/slurp)"

How do you know that these are not impostors? You can look up the reverse IP address to find the allocated owner of the IP address block. Good spiders always ask for robots.txt and they avoid paths that have been forbidden to them. The bad ones ignore this file.

Human visits invoke numerous requests in rapid succession, because a single page can contain numerous elements such as templates, images and external files. Here is the first log entry made by a human:

- 124.123.126.121 - - [02/Aug/2009:03:22:27 +1000]

MORE ABOUT... VISITS

A visit is one browser session. If you visit the *APC* magazine site, look at a few pages, then close the browser, that was one visit. If you didn't close the browser but let it sit in the background for a couple of minutes while answering the phone, then you browsed some more pages, that was still one visit.

Some analytics packages will set an arbitrary period of inactivity, usually 30 minutes, after which a new session begins for an open browser window. Some people never switch off their computer, so this makes sense. I turn mine off each night, but during the day I could have at least ten browser windows open in the background, and I may check many of them several times a day.

WEB ANALYTICS

MORE ABOUT... PAGE VIEWS

Page views are also known as impressions. A page view includes requests for all elements that make up the page. The analytics package can measure the time spent on each page, up to some arbitrary time limit, after which the session is assumed to have expired. When visitors look at several pages during each visit, you know that they are engaged with the site. When you look at a month's worth of these page views, you can see which parts of the web site are more popular than others. Sometimes these are well-written articles; sometimes it is an entire section that is more popular than the others.

"GET / HTTP/1.1" 200 15857 "http://www.google.co.in/search?hl=en&q=seo+ppc&btnG=Google+Search&meta=&aq=f&oq=" "Mozilla/5.0 (Windows; U; Windows NT 5.1; en-US; rv:1.9.0.10) Gecko/2009042316 Firefox/3.0.10 GTB5"

This visitor came from a Google India search for the phrase "seo ppc" and used Firefox 3 on a Windows XP machine. The server delivered a useful result (code 200).

- 124.123.126.121 - - [02/Aug/2009:03:24:02 +1000] "GET /images/favicon.ico HTTP/1.1" 404 - "-" "Mozilla/5.0 (Windows; U; Windows NT 5.1; en-US; rv:1.9.0.10) Gecko/2009042316 Firefox/3.0.10 GTB5"

Later, the server could not serve the favicon, so it delivered a "file not found" result (code 404).

You can follow the trail of human visitors by noting the pages visited and actions performed, such as filling out a form. The partial log entry could be something like this:

- POST /index2.php

BAD/UNKNOWN VISITORS

You will see unknown entries that could be benign spiders, malicious spiders posing as a human or search engine, or unknown ones yet to be identified. Unwanted spiders include inquisitive tools such as the Xenu broken link checker or copyright-related spiders, which just waste your bandwidth. You should block any unknown spiders or IP ranges once you are sure you are not blocking a desirable visitor.

- 209.202.168.77 - - [02/Aug/2009:00:16:26 +1000] "GET /robots.txt HTTP/1.0" 200 351 "-" "GingerCrawler/1.0 (Language Assistant for Dyslexics; www.gingersoftware.com/crawler_agent.htm; support at ginger software dot com)"
- 76.230.145.187 - - [02/Aug/2009:06:08:54 +1000] "GET /training-enquiry-form.html HTTP/1.0" 404 12642 "http://www.trainsem.com/training-enquiry-form.html" "Mozilla/4.0 (compatible; MSIE 6.0; Windows NT 5.1; SV1; YPC 3.0.2; .NET CLR 1.1.4322; yplus 4.4.02b)"

The first example above is simply a curious entry that I could investigate later; the second seems innocuous enough, but it is one of about 50 consecutive, identical file requests from different IP addresses. The one and only visit from these IP addresses is for that file.

That is probably a malicious visitor using numerous open proxy sites to check out my form for vulnerabilities. That was a defunct URL, as I had changed my site recently, so the bad guys must have harvested my URLs before the change and then sent its probe. In case I had blocked certain IP address ranges, such as a whole country, the spider used numerous open proxies in the US, assuming that I would be less likely to block normal ISP ranges.

PUTTING IT TOGETHER

By now you will agree that it is impossible to measure web site activity completely, but by understanding the limitations of two approaches — log file parsing and page tagging — you can make informed decisions. Next month we'll deep dive into Google Analytics, introduce some more jargon and make sense of its rich feature set.

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HIGH-PERFORMANCE PLAYTIME

MINOX SUNTIMER UV MONITOR

01

You'd think that most people would know when they're getting sunburnt. Well, think again. Most people don't notice until it's too late and the damage is done. The new Suntimer monitor acts like a watch that also measures the levels of ultra-violet radiation in your area. A small alarm lets you know when the maximum time for safe exposure has been reached. The Minox Suntimer also allows the input of individual variables such as skin type and the protection factor of sunscreen in use to allow for even greater accuracy. Now you can strap one on and get out into the spring sun without a worry... as long as you don't ignore the alarm. ***CZ***

.:: CONTACT Minox
.:: ONLINE www.opticsplanet.net
.:: PRICE US$49

CANON SELPHY CP780

02

Canon keeps on churning out the Selphys! Its latest, the Selphy CP780, is not only the most compact in the range, it is also the most archival-friendly. Canon claims that its specially coated, splash-proof prints will last up to 100 years when stored correctly. A variety of different-sized media choices include 6 x 4, wide, wallet-sized, and it can even do miniature stickers. All of these print out in around 60 seconds, which isn't bad for a printer of its size. Bluetooth compatibility allows printing directly from your camera or mobile phone, or you can print straight from your memory card using the built-in 2.5in LCD screen for reference. ***CZ***

.:: CONTACT Canon
.:: ONLINE www.canon.com.au
.:: PRICE $199

ALURATEK USB INTERNET RADIO

03

The Aluratek USB Internet Radio is really a jukebox in a USB key that allows you to access more than 13,000 radio stations in over 150 countries around the world for free. Simply insert the USB Internet Radio Jukebox into your computer's USB port and you have the world's major radio stations at your fingertips, where you can search for music by continent, country, state or browse through more than 50 different music genres. Once you find stations you like you can add them to your favourites folder, where you can keep in touch with local news and music from any part of the globe. There's no need to go without music ever again. ***CZ***

.:: CONTACT Aluratek
.:: ONLINE http://aluratek.com
.:: PRICE US$39.99

DUALSIM MINI MOBILE PHONE

04

Dual SIM phones are ideal for people wishing to consolidate their work and private phones into one unit, or are travelling overseas and need to use another carrier. An Australian distributor, DUALSIM started the trend earlier this year with its DUALSIM Slider phone, and was soon followed by Acer, with its Acer DX900. Now, DUALSIM has released an improved phone, the DUALSIM Mini, which weighs just 70 grams and retails for $299. It lets you simultaneously receive calls from two carriers or make calls from either carrier, but also comes with all the features you'd expect in a basic phone such as BlueTooth, an inbuilt camera, as well as MMG and WAP support. ***TS***

.:: CONTACT DualSim
.:: ONLINE www.dualsim.com.au
.:: PRICE $299

LOWEPRO TOPLOADER PRO

05

Camera bags have always been something you hide your gear in when you're not using it. Lowepro has come up with a bag that allows you to store your DSLR with a lens attached for quick and ready access. The contoured, asymmetrical shape of Toploader Pro AW follows the lines of a DSLR camera for a snug, protective fit that makes your camera easy to grab, shoot and put back. Quick-release buckles allow the user to close the bag without zipping it, enabling fast access plus security while on the move. A patented all-weather cover ensures that your expensive camera is kept safe in the event of rain. A must for any photography enthusiast. *CZ*

CONTACT	Lowepro
ONLINE	www.lowepro.com
PRICE	$135-$165

SCRIBBLE & WRITE

06

This handy device not only teaches your kids the alphabet but it also teaches them how to write. Designed as an interactive gaming/educational device, Scribble & Write turns the drudgery of learning to write into a fun game. The alphabetic keypad tests the child's memory of each letter of the alphabet while a stylus is used to prompt the user to trace over the chosen letter on the lit-up display. Children can also practise drawing simple shapes and pictures as an intro to the device before graduating to writing upper and lower case letters. This has the added effect of giving kids a headstart for school by working on their penmanship skills. *CZ*

CONTACT	Leapfrog
ONLINE	www.leapfrog.com.au
PRICE	$42.95

MY PUPPY PAL SCOUT & VIOLET

07

Remember the old Teddy Ruxpin toy that could read stories to kids while its mouth moved? Well he's nothing compared to these guys. Not only can these puppy pals remember your kids' names and put them in stories, they can also add your kids' favourite things plus songs and stories to personalise the experience. Plus, these puppies are wired for the web with downloadable content such as new songs and the ability to allow parents to follow their child's progress with regular reports. Kids can learn skills such as first words, daily routines, mathematics and more as the puppy tutors them. It's not quite Teddy from *A.I.*, but it is a lot more interactive than other toys. *CZ*

CONTACT	Leapfrog
ONLINE	www.leapfrog.com.au
PRICE	$49.95

PANASONIC RR-US570

08

Panasonic's new stereo voice recorder uses new 3x zoom microphone technology to cut down on distortion from surrounding noise. Assisted by a 270mW low noise amplifier, the US570 captures the sound clarity and volume equivalent to recording from a point three times closer to the subject. The use of the MP3 format makes it easier and more convenient to email or upload files to others. In addition to voice recording, the device offers USB storage for data files and images and offers MP3 playback of your favourite music so you can use it as an iPod alternative. Voice activation is the icing on the cake of what is a great voice recorder. *CZ*

CONTACT	Panasonic
ONLINE	www.panasonic.com.au
PRICE	$229 for 1GB model

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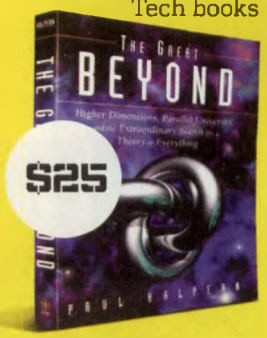

THE GREAT BEYOND
www.wiley.com.au

Paul Halpern takes you on an entertaining trip into the past as he sums up the history-making moments in quantum physics. This book provides a great insight into everything from Einstein to M-theory. Halpern explains wormholes, time travel, multiple universes and other oddities in a way that is as educational as it is amazing. Great reading for anyone who ever wanted to know the truth about the natural world.

VINTAGE GAMES
www.elsevier.com.au

Vintage Games explores the most influential videogames of all time, including Super Mario Bros., Grand Theft Auto III, Doom, The Sims and many more. Drawing on interviews as well as the authors' own lifelong experience with videogames, the book discusses each game's development, predecessors, critical reception and influence on the industry.

AUSSIE MADE
Why just listen to your iPod content when you can watch it as well? The iDock offers video capability as well as music.

Sieben iDock

Today's iPods can do more than just play music. The iDock can keep up with your digital needs by playing your video straight to your TV.

Australian company Sieben has released its second-generation iDock, which offers features that other more expensive models don't, namely photo and video compatibility.

With all but a few iPod models now offering video playback capability, it makes sense to get yourself a dock that can handle all your digital files. S-Video outputs, as well as USB and composite video connections ensure that the iDock is compatible with any home stereo, DVD, video player, home computer or TV. Now you can view photos or watch your iPod video content on your TV or even record it straight to DVD with a minimum of fuss. Gold-plated connections ensure high-quality stereo sound and optimal image transfers for the best audio and visual experience.

CONTACT	Sieben Technology
ONLINE	www.sieben-technology.com.au
PRICE	$129

A solid cast-metal body makes it obvious that the Sieben iDock is a quality piece of work as soon as you pick it up. It feels nice and weighty unlike other plastic docks currently on the market. The iDock is compatible with most recent iPods and is a simple, funky and affordable piece of Australian-made gadgetry that will allow loungeroom access to all your music, photo and video files, while also charging your iPod.

For what is a very reasonable price, we recommend you rush and grab one. If only everything in life could be this easy!

Chistopher Zammit

50 WORDS
. . . on where you would fly

Aion, the most anticipated MMO of 2009, is set to fly into Australian stores on September 23. The visually stunning game sees you ascend into divinity and fight in an epic celestial war between twin races of winged beings, the Asmodians and the Elyos. To celebrate, QVS International and NCsoft are giving one lucky winner the chance to win an Aion prize package consisting of a copy of the game and an A1 poster, which is exclusive to Australia. To enter, tell us in 50 words or less where you would fly to if you had wings? For more information on the lore and legend of Aion, visit ***aion.qvsoftware.com.au***

Email your entry to:
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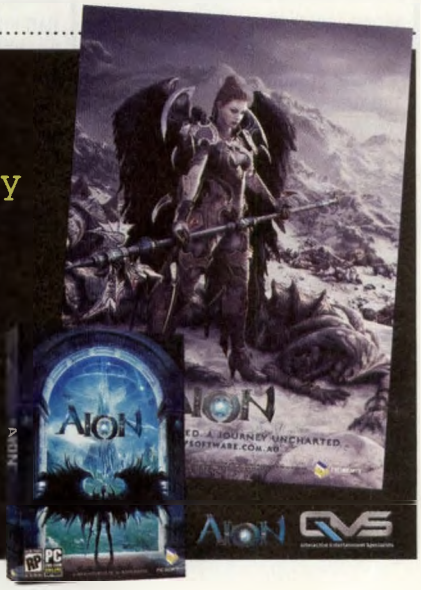


NINTENDO WII

Nintendo hit the big time (again) with the release of the Wii console and its innovative control system, selling more than the PS3 and Xbox 360 combined. Loved by gamers and non gamers alike, the Wii has brought gaming into the mainstream.

What's hot & not

TECHNOLOGY THERMOMETER

NINTENDO VIRTUAL BOY

Released in 1994 as a portable gaming system, this marvel of 3D technology was an even bigger flop than Ninntendo's GameCube. It was heavy, expensive and the games were in a monotone red colour that, although technically 3D, still looked like crap.

BLU-RAY PICKS OF THE MONTH

DEFIANCE

Set in Belorussia in 1941, *Defiance* sees Daniel Craig playing one of four Jewish brothers who return home to find their parents murdered in the early days of the Nazi scourge. While being hunted by the SS, the brothers end up leading an ever-expanding group of Jewish refugees in a Robin Hood-style fight against the Nazi invaders. You can't help but feel a sense of hope at seeing the Jewish people fight back in this well-told story based on true events. *Defiance* is a well-realised film that tells a great story of love, loss and human integrity amidst one of the worst incidents in human history. **CZ**

.: CONTACT Roadshow Pictures
.: ONLINE www.village.com.au
.: PRICE $42.95

THE BAADER MEINHOF COMPLEX

This confronting true-story delves into the world of terrorism during the 70's in which left-wing German students form their own terrorist group known as the RAF. They are anti-American and see the war in Vietnam as a crime akin to their own country's delve into violence during the days of the third Reich. The film follows the group as they begin a campaign of bombings, kidnappings and hijacks in the hope of forcing the German government to withdraw support for the war. This is a long film, but engrossing from beginning to end. *The Baader Meinhof complex* is an eye-opening look at the workings of a terrorist cell. **CZ**

.: CONTACT Icon Pictures
.: ONLINE www.iconmovies.com.au
.: PRICE $33.95

THE BOAT THAT ROCKED

A who's who of British film shows up in this insane story of a pirate radio station that illegaly transmitted groovy sixties tunes off the coast of England. What at times is an Animal House kind of comedy romp is littered with odd moments of seriousness that jar with the story's flow, but somehow manage to add depth rather than dullness. *The Boat that Rocked* breaks the mould (slightly), for Richard Curtis (who directed UK favouites such as *Love Actually* and *Four Weddings*) by not revolving the story around a central love theme. This is not a chick-flick but is well worth a look by members of both sexes. **CZ**

.: CONTACT Universal
.: ONLINE www.universalpictures.com
.: PRICE $39.95

X-MEN ORIGINS: WOLVERINE

Hugh Jackman returns as everyone's favourite mutant in this prequel to the popular X-Men franchise. The film follows Wolverine as he and his (insane?) brother Sabretooth live out their near immortal lives going from one jaw dropping action scene to the next. The plot is interesting but minimal with the film designed as more of a popcorn entertaiment piece than an exercise in dramatic storytelling. Popular X-Men characters such as Gambit and Deadpool make their film debut in what is essentially cinematic eye-candy aimed at the fans of the comics. It's time to leave reality behind and simply watch the action unfold. **CZ**

.: CONTACT Fox Movies
.: ONLINE www.foxmovies.com.au
.: PRICE $39.95

Macquarie WordGenius

PC spelling solution for students or Scrabble nuts.

You might have noticed that the net is slowly transforming English spelling into more popular (ie. Americanised) forms. In common use, this might not matter too much, but, in some areas, such as formal language as practised in the workplace, legal fields or in school, getting the correct Australian spelling can be very important. That's where Macquarie WordGenius comes into play. With a fantastic drag-and-drop interface, you can literally just pull whatever word you want to check from whatever app or web page you want. There's multiple versions available, and it'll save you reaching for the bookshelf too. Super handy!

.: CONTACT Eurofield Information Solutions
.: ONLINE www.wordgenius.com.au
.: PRICE From $19.95-$89.95

Quikfix
New releases

BOOM BLOX BASH PARTY

The second title in EA's collaboration with Steven Spielberg, Boom Blox Bash Party provides more of the same 3D block-obliterating puzzle zaniness. The integration of more multiplayer content differentiates Bash Party, as does downloadable content, and the 400 levels should be enough to keep you occupied for some time. Available on the Wii for $79.95.

LITTLE KING'S STORY

Ever fancied ruling your own little kingdom? With a fairy tale feel, beautiful art and a dash of good humour, Little King's Story casts you as a little boy who puts on a crown and finds he is a king. With a decidedly lazy populace, it's up to you to turn your sleepy province into a monarchy of world domination. Great Sim-style adventure fun and good for kids too. Available for the Wii for $79.95.

Wii Sports Resort

Peter Dockrill is on holiday (wishes you were here, etc).

The original Wii Sports shipped with the Wii as a freebie launch title, and, given that the Wii has sold more than 50 million copies, this officially places Wii Sports as the highest-selling video game of all time, surpassing the former record holder, Super Mario Bros. But just because it was a freebie didn't mean it wasn't any good; Wii Sports introduced the Wii as a new type of console experience — one in which you could stand up and get physically involved (probably the first time this had successfully been pulled off on a large scale). Plus, though simple, the sports on offer (tennis, bowling, baseball, golf and boxing) were fun and were great as multiplayer or party games. So, WSR carries big expectations and, for gamers at least, it doesn't disappoint. There's ten new resort-themed sports, and the game comes with a new peripheral, Wii MotionPlus, set to be supported in more upcoming games, which attaches to the Wii Remote to provide greater accuracy and sensitivity. All up, WSR is essentially another mini-game fest, but it's one which carries the polish, variety and attention to detail of a first-rate home-baked Nintendo game. Recommended.

.: AVAILABLE PLATFORMS
PC-DVD | **Wii** | PS 3
PSP | XBOX 360 | DS

.: CONTACT Nintendo
.: ONLINE www.nintendo.com.au
.: PRICE $99.95

✔ Lots of mini-game fun; great for parties.

✖ Not too much depth; can't shock 'em like the original.

.: VERDICT ★★★★☆

DEAD ON TARGET
Archery is just one of the new mini-games where MotionPlus is useful.

Fight Night Round 4

Troy Coleman wants to you to see his rope-a-dope.

It's been a long time since I've taken a really good look at a boxing game. On the whole, they've left me with a bad taste in my mouth. It took just one punch after loading Round 4 to get a good taste back, that metallic pang of blood, and boy-howdy I like it. It has a lot to do with how natural the controls feel; on the Xbox 360, play is controlled with the analogue sticks. Throwing jabs, hooks and uppercuts with a flick/rotate of the right stick while ducking and weaving with the left feels natural, accurate and powerful. It doesn't take long to realise that going hell-for-leather and randomly flailing punches results in eating canvas, and a more measured approach is needed. Players can jump straight into the action with one of more than 40 professional/historical fighters, or tailor a boxer with incredible detail. You can customise everything from a boxer's physical appearance, height, weight, team colours, boxing class and style then you can train, take on the Legacy mode, and build your player's skills and career from 'Bum' to the greatest there ever was. Fight Night Round 4 is incredibly addictive, with a cracking soundtrack, and will have you screaming "Let's get ready to rumble!" at top note for a long time to come. I dare your neighbours to make a noise complaint. DING!

.: AVAILABLE PLATFORMS
PC-DVD | Wii | **PS 3**
PSP | **XBOX 360** | DS

.: CONTACT EA
.: ONLINE fightnight.easports.com
.: PRICE $99.95

✔ Excellent action/character progression; great controls.

✖ Viewing angle feels odd at times.

.: VERDICT ★★★★½

FLOAT LIKE A BUTTERFLY
Sting like a bee with the natural-feeling controls and watch your character rise through the ranks — All-style.

Indepth
Proton Pack

It comes as little surprise to discover the humble Proton Pack has had a few modifications in the form of additional functions. The unit — via 'in-the-field-upgrades', OK, it's really the D-pad — has four distinct primary functions, each with its own secondary use.

PROTON STREAM
The classic beam to weaken and wrangle the ghosts.

BOSON DART
The secondary function of the Proton Stream, the Boson is an explosive ball of condensed energy.

STASIS STREAM
This beam slows the movement of ghosts. . . hence stasis.

SHOCK BLAST
The secondary function of the Stasis Stream, it's the Proton Pack equivalent of a shotgun.

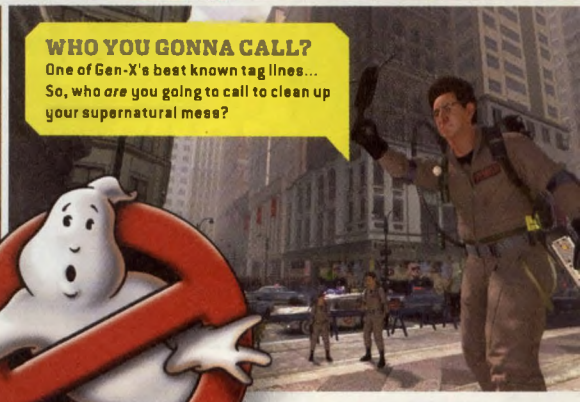
SLIME NEUTRALISER
Spray this bad-boy onto pooling black slime to dissipate it.

SLIME TETHER
The secondary function of the Neutraliser, it's an elasticised band of slime used for pulling objects.

MESON COLLIDER
A focused-energy long-range particle stream.

OVERLOAD PULSE
The secondary function of the Collider, the Pulse is a rapid-fire highly unstable volatile particle mode.

The only time when 'crossing the streams' is allowed. As long as you want to cover the city in bits of Mr Stay-Puft.



WHO YOU GONNA CALL?
One of Gen-X's best known tag lines... So, who *are* you going to call to clean up your supernatural mess?

Ghostbusters

Doe, Ray, Coleman; **Troy** has been waiting years to say that!

1984, a time when comedy was intelligent and genuinely funny; Ghostbusters rocked onto our screens and blew us away with its pure, delicious excellence — becoming an instant cult classic and one of the films that defined a generation. The second Ghostbusters film snuck in just before the nineties, the period of film I have dubbed '*the absolute demise of comedy*'.

2009, and Ghostbusters: The Video Game busts onto our consoles letting players finally experience supernatural ghost-wrangling. Dan Aykroyd (Dr. Raymond Stantz) considers the game to be essentially the 'third official movie', and as such, following their recent de-ghostifying returning Vigo to the painting, the 'Busters are expanding the franchise and taking on a non-speaking, goofy-faced new recruit (you) to help combat the ever-present threat of the supernatural. Gameplay is basically similar to a third-person shooter; armed with your trusty Proton Pack (see sidebar), PKE meter and goggles, players are called to various locations to take data samples, get slimed and take care of business 'Buster style. In terms of storyline, the whole affair is driven by a heavy blanket of dry, one-line innuendo-laced dialogue that feels a little forced 25 years after the cleverness of the original film. Overall, 'Busters is a successful exercise in blurring the boundaries between film and interactive media; it's a bit of well-presented, themed fun. Rent it and give it a run, but don't expect any longevity or replayability.

.: AVAILABLE PLATFORMS

PC-DVD	Wii	PS 3
PSP	XBOX 360	NINTENDO DS

.: CONTACT Atari
.: ONLINE www.ghostbustersgame.com
.: PRICE $109.95

✔ It's Ghostbusters.

✖ Far too linear.

.: VERDICT ★★★☆☆

chipchat

BY PETER DOCKRILL

Open Sesame!

Here at *APC*, we're a pretty cautious bunch, knowing what we do about the potential perils and pitfalls of not maintaining a secure password setup. But it's staggering to see just how easy it is to guess some of the most commonly used passwords — and you can do so, easily (and *ethically*) by heading on over to **www.sporcle.com/games/passwords.php**. Just hit the start button and you're given three minutes to guess the 20 most commonly used passwords of all time (I got seven — see if you can beat it). If that's not enough for you, check out **www.whatsmypass.com** to see an even more comprehensive listing of the 500 worst passwords of all time. Is your password in there? (If so, change it — now!)

For Foster's sake!

Foster's — it's the beer that's famous for being Aussie, even if no Australians actually seem to drink it. Heck, it's easier to find Foster's in an American TV show than it is in a local bottleshop. But, even so, we were surprised to find out just how Yankified the official web site for the brew was: if you visit **www.fostersbeer.com** you'll be asked to provide your date of birth in US MM/DD/YYYY format and kindly informed "You must be 21 to enter."

Strewth! Who's beer is this anyway?

CALL WAITING?
Aussie ISP is introducing real-time stats so its users know when to call (and when not to).

My Word!

In news set to quicken the heart rate of any OpenOffice.org user, Microsoft has been ordered to stop selling Word in the United States, after a Texas district court judge granted an injunction against the company. According to the ruling, Microsoft's use of XML in the 2003 and 2007 editions of Word infringes the patent rights of Canadian software company i4i Ltd, and the software giant may have to pay more than US$290 million in damages for the transgression. Microsoft is appealing the decision.

LOST FOR WORDS
Microsoft may be deprived of the right to sell Word in the States, after a recent court decision...

Wait not want not

Sick of being put on hold? Top-ranking Australian ISP Internode has launched a new web tool at **www.internode.on.net/about/performance/** that allows its customers to get real-time access to call wait times for its service departments. The idea is to let customers know when busy periods are (in order to encourage them to call during "low-demand" periods). Theoretically it's a win-win situation for the company and its users. Now if only every other company could get around to this way of thinking...

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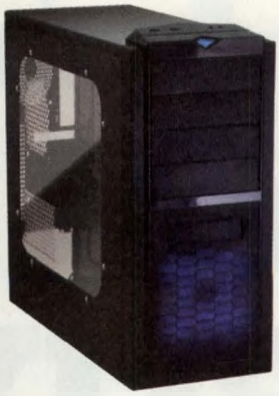

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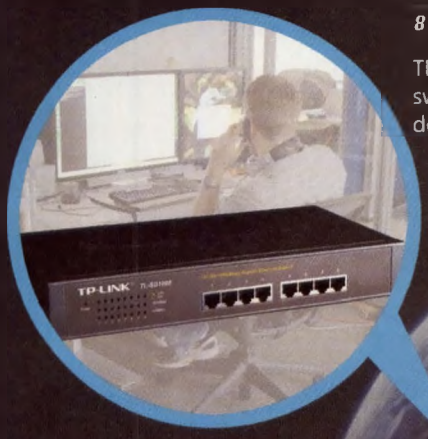

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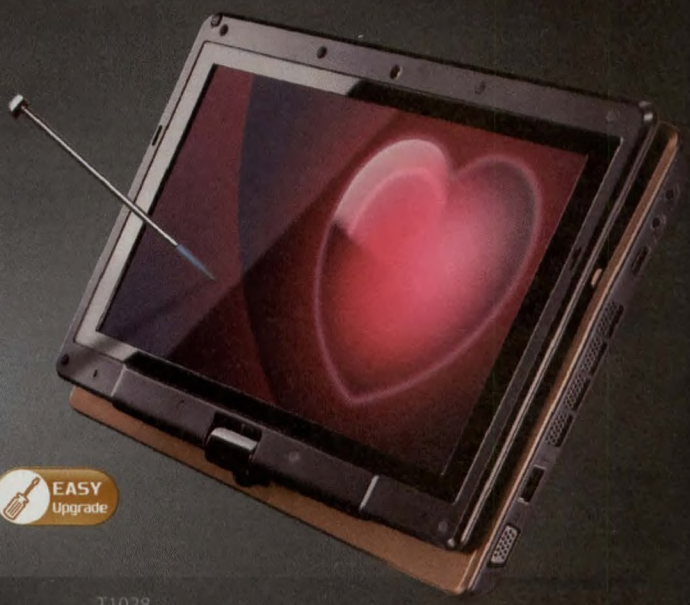

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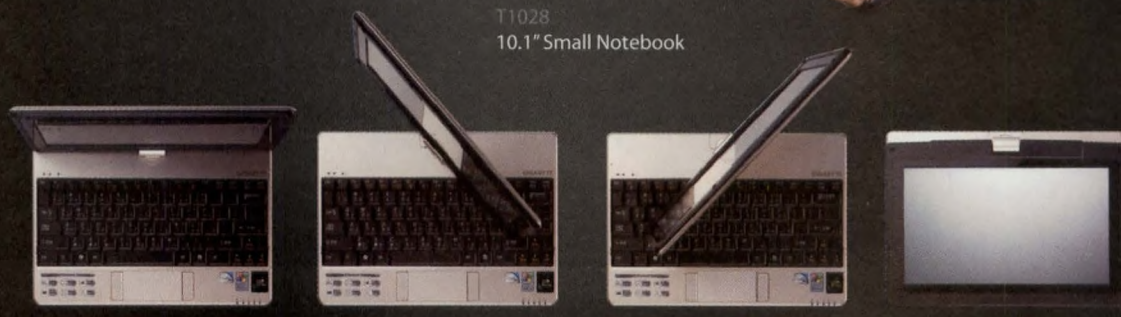

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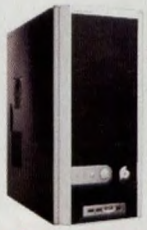

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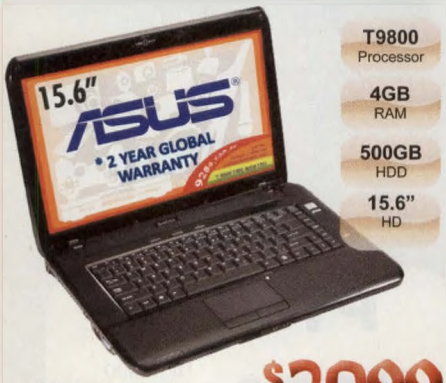

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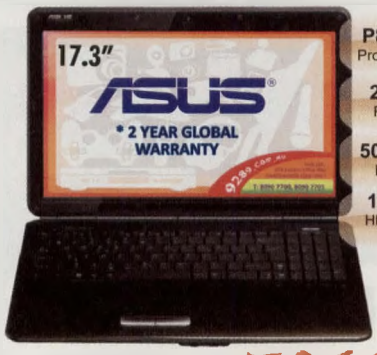

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Model	Genuine	TONNY
FO-3CR	$ 31.00	$ 16.00
FO-6CR	$ 24.00	$ 18.00
FO-9CR	$ 30.00	$ 18.00
FO-15CR	$ 44.00	$ 21.00

Epson Toner Cartridges

Model	Genuine	TONNY
EPL-5700/5800	$196.00	$ 49.00
EPL-5900/6100	$213.00	$ 49.00
EPL-6200	$163.00	$ 49.00
AL-C900/1900BK	$102.00	$ 65.00
AL-C900/1900C/M/Y	$220.00	$ 65.00
AL-CX11N/C1100BK	$107.00	$ 49.00
AL-CX11N/C1100C/M/Y	$164.90	$ 49.00
AL-C1000/2000BK	$124.00	$105.00
AL-C1000/2000C/M/Y	$249.00	$115.00

Panasonic Thermal Film

Model	Genuine	TONNY
KX-FA54E	$49.00	$18 Twin Pack
KX-FA55A	$49.00	$19 Twin Pack
KX-FA134	$82.00	$35 Twin Pack
KX-FA136	$63.00	$26 Twin Pack

Lexmark Toner Cartridges

Model	Genuine	TONNY
Optra E/E+	$ 142.00	$ 59.00
E120 prebate	$ 110.00	$ 55.00
E210	$ 152.00	$ 49.00
X215	$ 112.00	$ 49.00
E220 prebate	$ 129.00	$ 79.00

Model	Genuine	TONNY
E230/232/330/332	$ 122.00	$ 55.00
E310/312 (3k)	$ 176.00	$ 73.00
E320/322 (3k)	$ 155.00	$ 82.00
E321/323 (3k)	$ 155.00	$ 85.00
X342n (2.5k)	$ 137.00	$ 69.00

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Model	Genuine	TONNY
T028	$43.60	$ 4.40
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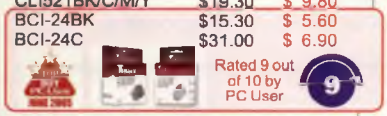
T038	$20.00	$ 5.00
T039	$28.40	$ 5.60
T0461	$22.00	$ 4.50
T0472/3/4	$14.90	$ 4.50
T0491/2/3	$21.00	$ 4.50
T0494/5/6	$21.00	$ 4.50
T0621	$22.00	$ 5.20
T0631	$16.00	$ 5.20
T0632/3/4	$15.20	$ 5.20
73N BK (T0731)	$17.00	$ 7.40
73N C/M/Y (T0732/3/4)	$17.00	$ 7.40
81N BK (T0811)	$27.00	$ 8.40
81N C/M/Y (T0812/3/4/5/6)	$27.00	$ 8.40
S020089 / T052	$35.10	$ 4.80
S020093/ T050	$29.00	$ 4.80
S020187/T050	$28.00	$ 4.80
S020189/ T051	$32.00	$ 4.80
S020191 / T052	$34.00	$ 4.80

Canon Ink Cartridges

Model	Genuine	TONNY
BX-3	$47.00	$23.10
BC-05	$59.60	$26.70
BC-20	$62.00	$22.90
PG-40	$34.00	$26.00
CL-41	$35.00	$26.50
BCI-3eBK	$22.70	$ 6.40
BCI-3eC/M/Y	$20.40	$ 5.70
BCI-6BK	$24.10	$ 5.70
BCI-6C/M/Y	$24.10	$ 5.70
BCI-6PC/PM	$24.10	$ 5.70
BCI-6G/R	$24.10	$ 5.70
CLI-8BK/pc/pm with chip	$22.50	$ 9.80
CLI-8C/M/Y with chip	$22.50	$ 9.80
PGI-5BK with chip	$22.50	$ 9.80
CLI-8BK no chip	-	$ 5.70
CLI-8C/M/Y no chip	-	$ 5.70
CLI-8PC/PM no chip	-	$ 5.70
PGI-5BK no chip	-	$ 5.70
BCI-15BK	$24.90	$ 6.10
BCI-16C	$40.70	$ 6.30
PG-510	$24.10	-
CL-511	$27.40	-
PGI520BK	$19.30	$ 9.80
CLI521BK/C/M/Y	$19.30	$ 9.80 NEW
BCI-24BK	$15.30	$ 5.60
BCI-24C	$31.00	$ 6.90



Kyocera Toner Cartridges

Model	Genuine	TONNY
TK-16H	$ 73.00	$ 61.00
TK-17	$103.00	$ 35.00
TK-18	$123.00	$ 38.00
TK-310	$130.00	$ 59.00
TK-510K	$ 98.00	-
TK-510C/M/Y	$172.00	-

Panasonic Toner Cartridges

Model	Genuine	TONNY
UG-3313	$242.00	$ 73.00
UG-5545	$242.00	-
KX-PDP8 Toner for KXP7100/7110	$136.00	$ 68.00

Lexmark Ink Cartridges

Model	Genuine	TONNY
18C0781A (#1)	$36.90	$24.60
10N0016 (#16)	$49.30	$18.40
15M0120 (#20)	$63.60	$24.00
10N0026 (#26)	$53.00	$23.00
18C0032 (#32)	$36.90	$21.30
18C0033 (#33)	$39.80	$23.10
18C0034 (#34)	$41.60	$25.00
18C0035 (#35)	$49.30	$27.00
12A1970 (#70)	$55.90	$21.00
18L0032 (#82)	$50.20	$26.10
18L0042(#83)	$62.60	$23.90

Brother Ink Cartridges

Model	Genuine	TONNY
LC-37BK	$25.20	$ 5.00
LC-37C/M/Y	$16.60	$ 6.50
LC-38BK	$24.50	$ 5.00
LC-38C/M/Y	$15.90	$ 6.50
LC-47BK	$34.60	$ 5.00
LC-47C/M/Y	$20.80	$ 6.50
LC-57BK	$34.50	$ 5.00
LC-57C/M/Y	$20.80	$ 6.50

HP Ink Cartridges

Model	Genuine	TONNY
C8721WA (#02BK)	$28.20	$11.00
C8771/2/3/4/5WA (#02C/M/Y/LC/LM)	$16.60	$ 8.20
C6615DA(#15)	$42.40	$14.10
C9351AA (#21)	$24.00	$16.00
C9352AA (#22)	$27.30	$21.00
C8727AA(#27)	$28.90	$14.10
C8728AA (#28)	$33.00	$22.00
51645AA (#45)	$44.70	$16.00
C6656AA (#56)	$30.60	$15.20
C6657AA (#57)	$48.90	$23.00
C6658AA (#58)	$38.80	$23.00
CB336WA(#74XL)	$44.80	$29.50
CB338WA (#75XL)	$49.80	$30.00
C6578DA (#78)	$48.80	$19.90
C9396A (#88 BK)	$49.60	$21.30
C9391/2/3A(#88C/M/Y)	$36.40	$14.70
C93662WA (#92)	$23.20	$14.70
C9361WA(#93)	$30.00	$16.90
C8765WA(#94)	$31.30	$16.90
C8766WA(#95)	$36.40	$20.00
C8767WA (#96)	$44.80	$18.10
C9363WA(#97)	$50.20	$15.80
C9364WA (#98)	$26.40	$15.80
C9369WA (#99)	$37.80	$26.20

Samsung Color Laser Toner

Model	Genuine	TONNY
CLP-300A BK	$ 95.00	$ 36.00
CLP-300A C/M/Y	$ 86.00	$ 35.00
CLT-409S BK for CLP-310/315,CLX-3170/3175	$ 74.00	-
CLT-409S C/M/Y for CLP-310/315,CLX-3170/3175	$ 63.00	-
CLP-510D7 BK	$153.00	$ 92.00
CLP-510D5 C/M/Y	$171.00	$ 92.00
CLP-600A BK	$131.00	$123.00
CLP-600A C/M/Y	$184.00	$126.00

HP Toner Cartridges

Model	Genuine	TONNY
Q2610A	$ 183.00	$ 55.00
Q6511X	$ 316.00	$ 79.00
Q2612A	$ 106.00	$ 45.00
Q2613A	$ 109.00	$ 45.00
C7115A	$ 95.00	$ 45.00
Q7516A	$ 276.00	$105.00
C4127X	$ 194.00	$ 59.00
CB435A	$ 95.00	$ 54.00
CB436A	$ 107.00	$ 54.00
Q1338A	$ 235.00	$ 85.00
Q5942A	$ 226.00	$ 95.00
Q5942X	$ 343.00	$105.00
Q5949A	$ 109.00	$ 49.00
Q5949X	$ 201.00	$ 55.00
Q7551X	$ 330.00	$ 76.00
Q7553A	$ 123.00	$ 55.00
Q7553X	$ 227.00	$ 59.00
C8061X	$ 194.00	$ 59.00
C4092A	$ 90.00	$ 45.00
C4096A	$ 153.00	$ 59.00

HP Color Toner

Model	Genuine	TONNY
CB540A	$109.00	$ 81.00
CB541/2/3A	$ 99.00	$ 81.00
Q6000A	$116.00	$ 78.00
Q6001/2/3A	$126.00	$ 78.00
C9730A	$339.00	$159.00
C9731/2/3A	$469.00	$159.00

Brother Toner Cartridges

Model	Genuine	TONNY
TN-2025	$ 81.20	$ 49.00
DR-2025	$ 149.20	$ 62.00
TN-2150	$ 85.00	$ 49.00
DR-2150	$ 147.00	-
TN-3060	$ 117.00	$ 49.00
TN-3185	$ 123.00	$ 49.00
TN-6600	$ 110.90	$ 49.00
TN-7600	$ 115.00	$ 49.00
TN-8000	$ 47.00	$ 19.00
TN-04BK	$ 243.00	$ 99.00
TN-04C/C/Y	$ 243.00	$ 99.00
TN-12BK	$ 129.00	$ 72.00
TN-12C/M/Y	$ 263.00	$ 105.00
TN-150 BK	$ 95.00	-
TN-150 C/M/Y	$ 109.00	-

Samsung Laser Toner

Model	Genuine	TONNY
SCX-4100D3	$123.00	$ 49.00
SCX-4216D3	$123.00	$ 49.00
SCX-D4200A	$123.00	$ 49.00
SCX-4521D3	$126.00	$ 49.00
SCX-D4725A	$123.00	$ 64.00
SCX-5312D6	$ 96.00	$ 70.00
SF-5100D3	$123.00	$ 49.00
ML-1210D3	$123.00	$ 49.00
ML-1610D2	$114.00	$ 49.00
MLT-D108S	$ 95.00	-
MLT-D109L	$145.00	-
ML-1710D3	$123.00	$ 49.00
ML-2010D3	$113.00	$ 49.00
ML-2150D8	$219.00	$ 82.00
ML-2250D5	$144.00	$ 59.00
ML-D3050B 8k	$288.00	$ 86.00

Canon Toner Cartridges

Model	Genuine	TONNY
CART 303(Q2612A)	$ 89.00	$ 45.00
CART 308(Q5949A)	$ 89.00	$ 49.00
CART 310 II(Q6511X)	$ 264.00	$ 79.00
CART 312	$ 81.00	-
EP-22 (C4092A)	$ 75.00	$ 45.00
EP-26	$ 99.00	$ 45.00
CART307BK(Q6000A)	$ 99.00	$ 78.00
CART307C/M/Y(Q6001/2/3A)	$ 105.00	$ 78.00
CART 301 BK (EP87 BK)	$ 125.00	$ 77.00
CART 301 C/M/Y (EP87CMY)	$ 140.00	$ 77.00
CART311BK	$ 155.00	-
CART311C/M/Y	$ 199.00	-
FX-3	$ 99.00	$ 45.00
FX-7	$ 139.00	$ 65.00
FX-9	$ 120.00	$ 49.00
CARTN	$ 231.00	$ 59.00
CARTU	$ 105.00	$ 45.00
CARTW	$ 149.00	$ 53.00
E-31	$ 195.00	$ 55.00

Konica Minolta Color Laser Toner

Model	Genuine	TONNY
QMS Magicolor 2300/2350 BK	$121.00	$ 69.00
QMS Magicolor 2300/2350 C/M/Y	$161.00	$ 69.00
QMS Magicolor 2400W/2430DL/2450 BK	$119.00	$ 85.00
QMS Magicolor 2400W/2430DL/2450 C/M/Y	$164.00	$ 85.00

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* Please visit AVerMedia website for the most updated drivers and software application.
** TV Tuner cards with WMC AQ logo can be checked on Microsoft official website http://winqual.microsoft.com/HCL/ (Ref. date: 17/08/2009)

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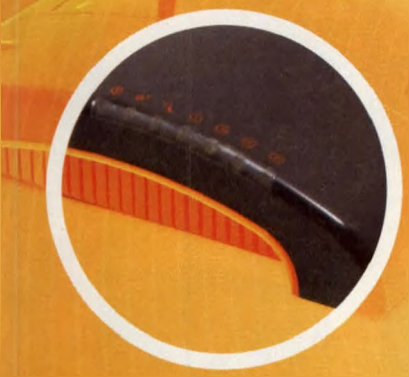

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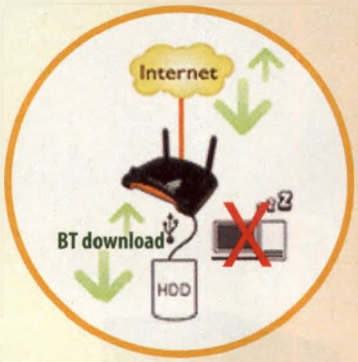

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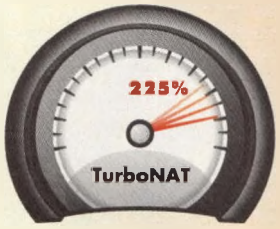
TurboNAT (Max. 95Mbps)



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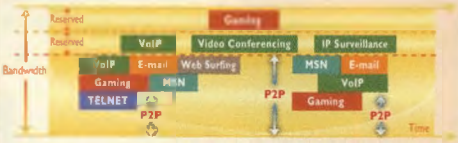

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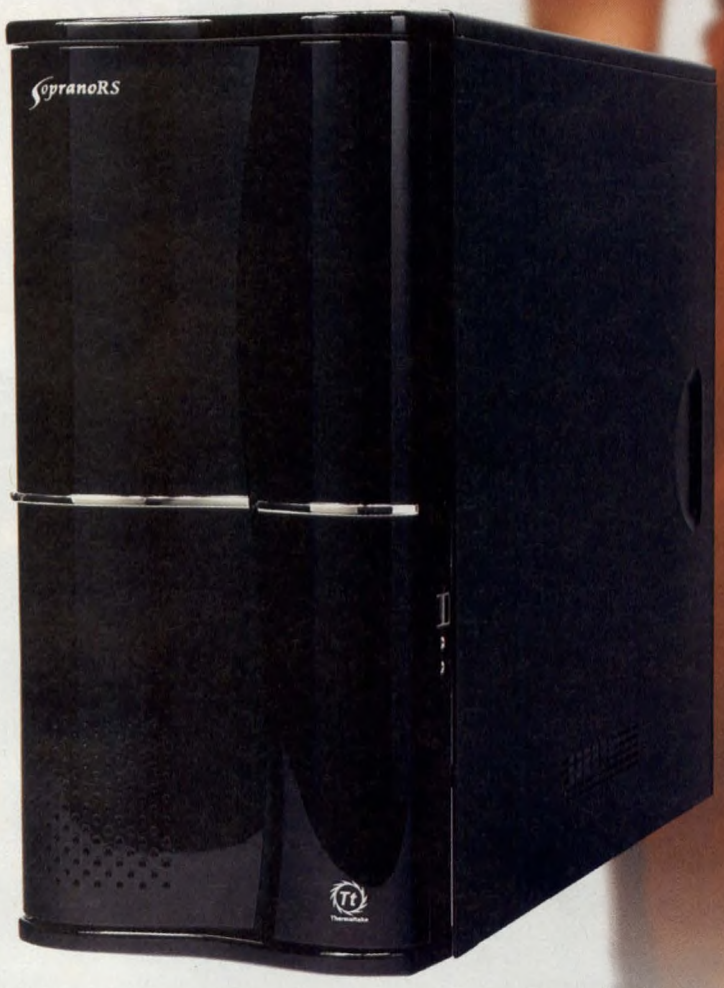

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- IR LED: 5X23PCS IR LED Working Distance: 20M
- Usable Illumination: 0 Lux (Built in IR LED ON)
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- Microphone Build in Optional
- Dimension: 94x68.5(H)mm Weight:300g

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- Usable Illumination: 0 Lux (Built in IR LED ON)
- Lens: Board Lens 3.6mm/F2.0
- Microphone Build in Optional
- Dimension: 94x68.5(H)mm Weight: 300g

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- Constant Speed Dome IR&IP Camera
- IR LED: 5X23PCS IR working distance: 20M
- Lens: Board Lens 3.6mm/F2.0
- Support D1 Resolution Image
- MPEG-4 Compression
- Dimension: 131x96mm; Weight: 1000g

DreamVision Speed Dome IR Camera D-LPT24HF
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- 360 Degree Pan Tilt IR Dome Camera
- Pan range: 0°~360°, Tilt range: 0°~90° Flip
- Pan Speed: Max 50°/sec, Preset: 16
- RS485 control
- IR LED: 24pcs, IR working distance:20M
- Lens: Board Lens 6mm/F2.0
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- Color 1/3" SONY, 420 TV Lines
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- Lens: Board Lens 4mm/F2.0
- Support D1 Resolution Image
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- Dimension: 131 x 96mm

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